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CHAPTER I

INTRODUCTION

'Physics beware of metaphysics.'

SIR ISAAC NEWTON.

IT is not the purpose of the present work to furnish a detailed refutation of the philosophy of Professor Bergson. It is my purpose to investigate only those portions of it which profess to be founded on facts, and therefore to come within the province of science. Metaphysical systems generally, however we may admire their wonderful ingenuity and subtlety, can have no interest for science unless they are founded on gross material facts, which can be examined and verified. As a rule their beautifully interwoven gossamer threads are of far too fine a texture to bear contact with the brutal hardness and reality of a fact. They can float gaily in the air without any solid support: while

thus floating, they have no practical interest for us, who are compelled to crawl painfully along the earth. But when one of these ethereal systems attempts to take root on solid ground, it is apt to get mangled and torn, wherever it touches earth; and the best chance of safety for the superstructure is to float off again into the rarified atmosphere whence it came.

The metaphysic of Bergson has ventured here and there to come to earth. Wherever it has thus done so it has exposed itself to damage from scientific criticism; and my purpose here is to indicate some of the rocks and points which have made large rents in its delicate substance. But the superstructure itself will be left intact. And why? Not indeed because it has the slightest claim on our credulity, but because it is only theories that profess to be founded on facts, that can be refuted by facts. Take, for instance, one of the great questions fought over by the Schoolmen of the Middle Ages, *Utrum Deus intelligat omnia alia a se per ideas eorum, an aliter.* The process by which God conceives ideas is so utterly futile a discussion, so infinitely removed from all contact with human experience

or facts, that a hypothesis on the subject is as little susceptible of disproof as it is of proof; and any one attacking the hypothesis falls into as many absurdities as one defending it. If some one were to rise up and announce that, right away in the depths of space, beyond the reach of our most powerful telescopes, there existed another Earth identical with ours, inhabited by our doubles, who were doing always the same things that we were doing and at the same moment, no sort of scientific refutation would be possible. All that science could say would be: Where is your evidence? To that our metaphysician gives answer that he knows it by direct intuition, and triumphantly invites the man of science to disprove it. Not improbably he will add some complimentary expressions about people who have no faith: and believe only in the things they can touch and see. Now the man of science cannot disprove it: the matter is entirely outside the region of experience, and is as little susceptible of disproof as it is of proof. All that he can say is that, once you pass beyond experience, there is no limit to what you may believe: *de non apparentibus et non existentibus eadem est*

ratio. Any statement, however ridiculous, may be supported by such methods; and the opposite of that statement may be similarly supported. And so the metaphysician goes on his way rejoicing, while the man of science turns contemptuously from what he can only regard as foolish puerilities.

When thus crudely stated, the futile nature of all metaphysical discussion will be patent to almost every one. How is it, then, that for thousands of years back these ghostly systems have continued to be spun by able men, and have continued to find disciples, in spite of the regularly recurring overthrow which inevitably overtakes each after a short time? The answer is that their stronghold lies in their obscurity, in the maze of words through which they are invariably propounded. One thing all metaphysical systems have in common—and that is, incomprehensibility, of a more or less pronounced character. An intellect stretched and strained to the uttermost in the attempt to grasp the leading points in a new philosophy is by that very fact disabled from judging it as though it were a simple proposition. Every juggler knows

how easy it is to divert attention from something he does not want his public to see. By arranging a number of people round a table, and compelling them to fix their attention in a certain way, we can make them honestly believe that the table is turning round of its own accord. In short, any excessive tax upon the attention disables the judgment proportionally: the more the mind is concentrated on one point, the less is it capable of detecting fallacies outside. In simple matters we can easily see through a difficulty: the ditch is promptly jumped. But when we come to precisely the same difficulty in the misty obscurity of metaphysics, we cannot see the other side. The ditch is no wider than before, but we have on our backs all the vast load of metaphysical verbiage, and it is so heavy we cannot jump the ditch: we can barely stagger along under it as it is. Consequently we find that metaphysical systems in general have a vogue directly proportional to their unintelligibility. That is their only safeguard: to put them into plain language would be to bring them tumbling to the ground. Roger Bacon, the illustrious forerunner of modern science, must surely

have been thinking of contemporary philosophy, when he mentioned as a great stumbling-block to truth *propriae ignorantiae occultatio cum ostentatione sapientiae apparentis*, the concealment of ignorance by ostentation of seeming wisdom. The elaboration of wonderful schemes, without a particle of evidence, can only pass muster in these days, provided that they are so inscrutable as barely to be comprehensible at all. Kant defined 'self' as an 'original transcendental synthetic unity of apperception.' Now there are many propositions which we might accept about the original transcendental synthetic unity of apperception, which we should decline to accept about our 'self.' In these days philosophy, developed from Hegel, has maintained itself by adopting a standard of incomprehensibility never before paralleled. And the public, supposing that there must be something behind these fine words, gasp with admiration, and blindly worship the putative wisdom of the latest Delphic oracle.

The attitude maintained throughout this book is that metaphysics is a maze of sesquipedalian verbiage, beyond the reach of Science to defend or to refute. A metaphysician is like the man

who wishes to teach us the geography of the other side of the moon. Since neither he nor we have ever seen it, we are not in a position to confute him. But, however loudly he invokes his direct intuition, we are not going to believe it, until we are offered some evidence on the subject. Nor are we going to believe the metaphysics of Bergson, or of any other philosopher, until we are presented with facts that we can understand, in place of words that represent no actual ideas.

The metaphysic of Bergson has all the qualities of incomprehensibility that are essential to the most respectable philosophy. His theory of time and the vital impetus is indeed so obscure that it was only after close study that I was able to represent mentally the author's point of view. Having mastered his doctrine, I am now chiefly concerned to mention that a thorough search through his works has failed to disclose one single fact, one particle of positive evidence, offered in support of it; such facts as are named are all directed only *against* antagonistic doctrines. Words, metaphors, fine writing we have in abundance; but what we want is

facts, and that is just what we have failed to find. Doubtless Bergson has felt something of this little deficiency; for he depreciates the intelligence, saying that it cannot understand life; but that only instinct can understand life. By instinct the Professor means direct intuition. And of what use to us is the direct intuition of Professor Bergson?

I do not propose, therefore, to enter into any discussion of Bergson's metaphysics, except in so far as they touch upon material facts. I would as soon start wrangling with him about the other side of the moon. But since he does attempt to overthrow certain conclusions rested by science on facts, I am concerned to meet him on these particular points.

Before his arrival upon the scene, philosophy in England was in a stagnating condition. The orthodox metaphysics of the time was of so esoteric a character as to be almost completely devoid of influence outside the circle of its special votaries. It was opposed by the Pragmatism of William James. But this system, though receiving wide support, confines itself mainly to a discussion of the nature of Truth,

and could not satisfy the everlasting craving for knowledge about the essential phenomena of Life. Although, therefore, no specific philosophy was before the public, there were two opposite streams of opinion, which vaguely represented the philosophy of the general run of humanity. On the one hand, there was the teleological view of the Universe—the idea that all things are trending towards some pre-arranged goal, that every fact and every event has some definite purpose in the fulfilment of a plan which is to bring humanity and the universe to the consummation marked out for it. On the other hand, there was the so-called mechanistic view of the Universe—the idea that the laws of mechanics, physics, and chemistry, are adequate to account for the evolution of the Universe, including the objective phenomena of Life. According to this view, the nebula which preceded the solar system developed,—under the ordinary laws of matter and motion—to the state in which we now see it; in such wise that a physicist, who was supplied with exact data concerning the original distribution of matter and energy in the nebula, and armed with an

all-powerful mathematic, could have deduced the exact condition of the universe in any required subsequent era.

The teleological view was that which most appealed to people's sentiments; it was the view that the public at large desired, and strongly desired, to see triumphant. The mechanistic view, on the other hand, seemed to have the authority of Science: it was supported and strengthened by every successive scientific discovery that had any philosophical bearing whatever: it was thoroughly popularised by the Darwinian theory of Evolution, in which mechanistic methods were exclusively employed. In short, the position was that the public nourished a deep desire for the truth of the teleological view, accompanied by a strong feeling of its inadequacy, and a deep dread of the mechanistic view.

Into this unsettled state of affairs has now been shot the thunderbolt of Bergson's philosophy, in which a third alternative is presented. Bergson repudiates teleology; and he also repudiates the universal dominion of physical law. He postulates a Vital Impetus or push which drives forward the development of life, but not

to any specific end or with any specific purpose. The impetus is not physical, but psychical, and therefore not controlled by the laws of Physics, or any other science. Can we wonder that this attempted compromise has attracted wide support? The teleological position had long been felt to be untenable, and men warmly welcomed a new theory which seemed to offer a possible escape from the rigid determinism of science. A cynic might smile at the way in which many of those, to whom teleology was dearest, have rushed to the refuge which they thought they saw in Bergson's metaphysics. They abandon their theology and its appropriate metaphysics, with an alacrity which eloquently tells of their small confidence in it, as soon as they hear of *any* other hypothesis that will keep them outside physical law. Various men of science, who have sentiments much like other people, have in a guarded way encouraged the new belief; while admitting the absence of evidence, they see no reason against it, or they think there is a 'loophole' for believing in it.

The attitude of this book is purely mechanistic. I am not concerned to defend the tele-

ological theories, which Bergson so ably condemns, and which are so readily abandoned by their proper defenders. Let them enter peaceably into the crowded metaphysical lumber-room of lost causes. I am, on the other hand, concerned to defend the mechanistic theory, and to examine what foundation in facts is presented by the new hypothesis now ranged against it. In the inorganic world, the dominion of physical law is now rarely questioned; the controversy burns only round the organic world, and to that department, therefore, I shall give special attention.

At the outset, I may be asked the question, what are your metaphysics? I answer—we have no metaphysics. We do not believe in metaphysics. We do not believe in any theory, unless it is supported by facts; and any investigation of facts belongs not to metaphysics, but to some special branch of science. Still we may be asked to define our position on certain definite questions: are we idealist, or materialist, or realist? We are none of them. Idealism, indeed, offers some attraction to the intellect. Our whole subjective life consists of conscious-

ness, mental images, etc., of a non-material order. They are awakened by purely physical activity occurring in the cells of a certain part of the brain. How, then, can these mental images resemble the external objects they represent when called up only through the intermediation of a nervous current? Absolute nature must be altogether different from our mental representations, and we appear to be landed in Berkeleyan idealism.

On the other hand, if we look at the universe through materialist spectacles, we find no necessity therein for postulating any consciousness whatever. Things and events would be just the same without it. So that there is an element of truth both in idealism and materialism, but—as we believe—a much larger element of metaphysical fancy in both of them. Let me endeavour to elucidate this position.

It has long been a platitude of Psychology that the *modus operandi* of the intellect is by bringing two ideas into relation with one another. The relations are given names such as association by contiguity, by similarity, etc.; but it suffices for my purpose that in the last

analysis the function of intellect is to bring two disconnected ideas into relation. Newton saw an apple fall upon the ground: he had previously studied the orbits of the planets: and one of the most profound intellectual operations ever performed was that in which one of these events called up by similarity the other, the two being brought into relation as aspects of a single fact. Every intellectual operation thus requires two terms. Now when we are trying to explain the universe; when, that is to say, the whole of our universe is one of the terms, there is nothing left to constitute the other; nothing remains outside, into relation with which it may be brought. Consequently the intellect gropes in the dark. It feels in all directions for a second term, but nowhere finds it. Why then assume a second term? We are compelled by the constitution of our minds to assume it. Invariably our cognitions have two terms; we are unable to conceive of any cognition with only one term. The intellect must therefore break down when the entire product of experience constitutes one of the terms. It is like a man who tries to run with only one leg. The mind of man can never solve

the problem of metaphysics; it cannot even say whether there is a problem to be solved. All it can do is to examine the limitations under which the intellect works, to note that those limitations must for ever give rise to the sensation of an unsolved problem, and to perceive that all attempts to solve it are but the helpless writhing of the soul under the inexorable conditions of its own existence.

CHAPTER II

THE PHILOSOPHY OF PROFESSOR BERGSON

'Man usually believes, if only words he hears,
That also with them goes material for thinking.'

GOETHE.

A DESCRIPTION of Professor Bergson's views must be a matter of very great difficulty to an opponent. Holding, as I do, that Bergson's metaphysics are a cloud of words, carrying with them no real meaning, it will be necessary that an impartial exposition should likewise be verbose and cloudy. Too clear a lucidity, too close a search after meanings instead of words, would precipitate the cloud and bring the theory to ground with a drenching rainfall of verbiage on the reader's head. In justice to the reader, we have to be lucid: in justice to Professor Bergson, we have to be obscure, and that, too, although I am deeply imbued with the spirit in which Byron criticised Coleridge:

'Explaining metaphysics to the nation;
I wish he would explain his explanation.'

I repudiate, therefore, all responsibility for the views and reasoning of this chapter, and for any obscurity in the mode of statement. My effort will be directed solely towards reproducing Bergson's principles as accurately as possible. All criticism upon them is reserved for Chapter III.

The basis of Professor Bergson's system is a new mode of regarding time. According to Kant, time and space are forms of thought; but science, and the mechanistic philosophy based upon science, has given all its attention to space, and has to a great extent neglected time. True, says Bergson, time is assumed during which events take place: evolution takes long stretches of time: time enters largely into the problems of physics: but it is *abstract* time. No real importance is attached to it. It is simply a condition of events happening, and no further attention is given to it. Moreover, even here, time is commonly expressed and conceived in terms of space. A clock indicates time by hands moving in space; a physicist compares times by lines of various lengths on paper. In short, our science is a science of space and not of time.

Now consciousness and life differ from material

objects in their non-occupancy of space. To them, only time is applicable: one conscious state gives rise to another with never-ceasing change and succession: they exist in time, and not in space. And the time is *concrete*, or *real*, totally different from the abstract time postulated by science in its study of objective phenomena. 'My mental state as it advances on the road of time, is continually swelling with the duration which it accumulates: it goes on increasing—rolling upon itself, as a snowball on the snow.'[1] So constant is transition that 'there is no essential difference between passing from one state to another and persisting in the same state.'[2] It is a mistake to tie together our conscious states as manifestations of some 'ego.' Time is all that connects them: indeed they *are* time: 'As regards the psychical life unfolding beneath the symbols which conceal it, we readily perceive that time is just the stuff it is made of.'

'There is, moreover, no stuff more resistant nor more substantial.'[3] This *concrete* time contains within itself at any moment its whole past, though of course the whole does not appear

[1] *Creative Evolution*, p. 2. [2] *Ibid.* [3] *Ibid.*, p. 4.

in every idea. 'We think with only a small part of our past, but it is with our entire past, including the original bent of our soul, that we desire, will and act.'[1] Since consciousness contains the entire past within itself, and each moment adds something new, no state of consciousness can ever be repeated. 'Thus our personality shoots, grows and ripens without ceasing. Each of its moments is something new added to what was before. We may go further: it is not only something new, but something unforeseeable.'[2] 'For a conscious being, to exist is to change, to change is to mature, to mature is to go on creating one's self endlessly.'[3] The organism, says Bergson, is distinguished from inorganic matter, by its tendency to individuation. It is, therefore, incomparable with any inorganic cut-out portion of the universe. The only analogy is with the universe as a whole. 'We must no longer speak of *life in general* as an abstraction, or as a mere heading under which all living beings are inscribed. At a certain moment, in certain points of space, a visible current has taken rise; this current of life, traversing the

[1] *Creative Evolution*, pp. 5, 6. [2] *Ibid.*, p. 6. [3] *Ibid.*, p. 8.

bodies it has organised one after another, passing from generation to generation, has become divided amongst species and distributed amongst individuals without losing anything of its force, rather intensifying in proportion to its advance.'[1] 'Life is like a current passing from germ to germ through the medium of a developed organism.'[2] 'Now, the more we fix our attention on this continuity of life, the more we see that organic evolution resembles the evolution of a consciousness, in which the past presses against the present and causes the upspringing of a new form of consciousness, incommensurable with its antecedents.'[3] Since each moment adds something totally new, the future could not even with infinite knowledge be prophesied, as alleged by the mechanistic hypothesis of science. Physics and chemistry will never give the key to life: chemical synthesis has never yet succeeded in reconstructing anything but the waste products of vital activity. The only refutation of the physico-chemical theory that is possible is drawn 'from the consideration of real time.'[4] A mathe-

[1] *Creative Evolution*, p. 27.
[2] *Ibid.*, p. 28.
[3] *Ibid.*, p. 29.
[4] *Ibid.*, p. 39.

matical and final refutation is, in the opinion of Professor Bergson, impossible. Huxley's defence fails, he says, through neglect to recognise the concreteness of time. In Huxley's argument 'time is still spoken of: one pronounces the word, but one does not think of the thing. For time is here deprived of efficacy, and if it *does* nothing, it *is* nothing. Radical mechanism implies a metaphysic in which the totality of the real is postulated complete in eternity, and in which the apparent duration of things expresses merely the infirmity of a mind that cannot know everything at once. But duration is something very different from this for our consciousness, that is to say, for that which is most indisputable in our experience. We perceive duration as a stream against which we cannot go. It is the foundation of our being, and, as we feel, the very substance of the world in which we live. It is of no use to hold up before our eyes the dazzling prospect of a universal mathematic; we cannot sacrifice experience to the requirements of a system. That is why we reject radical mechanism.'[1]

[1] *Creative Evolution*, p. 41.

The Professor then goes on to attack 'radical finalism' or the teleological view, with which we are not concerned in this work. He affirms, however, that his own philosophy is closer to the teleological than to the mechanistic standpoint. He then proceeds to a proof of the insufficiency of the mechanistic theory to account for the evolution of life. 'Pure mechanism would be refutable, and finality, in the special sense in which we understand it, would be demonstrable in a certain aspect, if it could be proved that life may manufacture the like apparatus, by unlike means, on divergent lines of evolution; and the strength of the proof would be proportional both to the divergency between the lines of evolution thus chosen and to the complexity of the similar structures found in them.'[1] That is to say, if we find the same highly complex structure on two divergent lines of evolution, that fact will constitute proof that these structures cannot have been evolved by the mere haphazard operation of physical forces, but must be due to some primitive impulse of life, which works the same effect under entirely different conditions. Such

[1] *Creative Evolution*, pp. 57, 58.

a structure we have in the eye of vertebrates and molluscs, such as Pecten. 'We find the same essential parts in each, composed of analogous elements. The eye of the Pecten presents a retina, a cornea, a lens of cellular structure like our own. There is even that peculiar inversion of retinal elements which is not met with, in general, in the retina of the invertebrates. Now, the origin of molluscs may be a debated question, but, whatever opinion we hold, all are agreed that molluscs and vertebrates separated from their common parent stem long before the appearance of an eye so complex as that of Pecten. Whence, then, the structural analogy?'[1] The accumulation of insensible variations, according to Bergson, is far too remote a probability to justify our credence. The mutation theory of de Vries is at least as inadequate. For any improvement in vision demands a simultaneous alteration in an exceedingly large number of different elements: and a simultaneous set of mutations defies probability far more than a simultaneous set of small variations. Correlation cannot be invoked: it is a practical abandonment of the theory of accidental varia-

[1] *Creative Evolution*, p. 66.

tion. The only hypothesis in the field, competent to give an explanation, is that which affirms the inheritance of characters acquired by direct action of the environment upon the organism, or by reaction of the organism on the environment—neo-Lamarckism. The dogmatic denial of this possibility by modern biologists is quite unjustified; nevertheless 'neo-Lamarckism is no more able than any other form of evolutionism to solve the problem.'[1]

Each of these views, however, 'being supported by a considerable number of facts, must be true in its way.'[2] The error is in regarding the origin of variations as accidental. 'We cannot help believing that these differences are the development of an impulsion which passes from germ to germ across the individuals, that they are therefore not pure accidents, and that they might well appear at the same time, in the same form, in all the representatives of the same species, or at least in a certain number of them.'[3] Such is the only hypothesis that provides escape from the impossible assumption of chance variations: the example of the eye shows that 'a

[1] *Creative Evolution*, p. 89. [2] *Ibid.* [3] *Ibid.*, p. 90.

psychological cause intervenes;'[1] and the most solid ground of the neo-Lamarckians is where they postulate as the cause of variation an effort of psychical character on the part of the varying organism. Thus, says our philosopher, we come back to an original impetus of life which is the 'fundamental cause of variations.'[2] Life is an original psychical impetus, running through inert matter like a stream: wherever it flows, the matter becomes organised into what we call living individuals. The impetus is of the nature of conscious effort: wherever that effort has been great, the resulting organisation of matter will be advanced: wherever it has been small, the resulting organisation will be backward. Thus, to return to vision, the explanation lies in one branch of the stream of life taking the form of vision. Wherever this branch flows it organises matter into the form of an eye. If the effort has been great, a complex and perfect eye results, like that of a bird. If, on the other hand, it has been small, it will have wrought a structure less perfect, but on a similar plan. Hence in the most diverse species, the

[1] *Creative Evolution*, p. 91.
[2] *Ibid.*, p. 92.

resemblance between these most complicated structures is explained.

From this explanation of what Life *is*, Bergson turns to consider what are the main channels into which it has divided. Matter offers many impediments and obstacles to the free flow of Life, and this resistance had to be overcome. 'Life seems to have succeeded in this by dint of humility, by making itself very small and very insinuating, bending to physical and chemical forces, consenting even to go a part of the way with them.'[1] The number of channels into which Life divided is represented by the number of species, or of individuals, into which organisms are grouped: and the true causes of differentiation are 'those which life bore within its bosom.'[2] Life began with the tiny specks of protoplasm 'possessed of the tremendous internal push that was to raise them even to the highest forms of life.'[3] 'The bifurcations on the way have been numerous, but there have been many blind alleys beside the two or three highways; and of these highways themselves, only one, that which leads

[1] *Creative Evolution*, pp. 103, 104. [2] *Ibid.*, p. 104.
[3] *Ibid.*, p. 104.

through the vertebrates up to man, has been wide enough to allow free passage to the full breath of life.'[1] In so far as there is an impetus towards social life, the brunt of it 'was borne along the line of evolution ending at man, and the rest of it was collected on the road leading to the hymenoptera.'[2] 'The vital impetus, being of psychical character, has power of choice, and might, if it had chosen, have saved itself the effort of so great a progress, and rested after reaching the rank of the extinct fossil forms. But it has not done so: it has run into three main divisions: torpor, intelligence and instinct: which therefore are complementary to one another. In plants, torpor is paramount. Among animals, the main directions are, as already stated, towards men and hymenoptera, with intelligence and instinct respectively. Yet each group carries with it subordinate elements from the other groups. 'When a tendency splits up in the course of its development, each of the special tendencies which thus arise tries to preserve and develop everything in the primitive tendency that is not incompatible with the work in which it is

[1] *Creative Evolution*, p. 105. [2] *Ibid.*, p. 106.

specialised.'[1] Thus 'sexual generation is perhaps only a luxury for the plant, but to the animal it was a necessity, and the plant must have been driven to it by the same impetus which impelled the animal thereto, a primitive, original impetus, anterior to the separation of the two kingdoms.'[2] 'The rôle of life is to insert *indetermination* into matter: to release it from the subjection to physical law. The nervous system among animals is the organ which supplies indetermination. Accordingly the progress of life has been above all a progress of the nervous system. Among plants, on the other hand, it has been directed mainly towards bending the energy of solar radiation to break up the molecules of carbon dioxide and effect a synthesis from inorganic materials. 'The same impetus that has led the animal to give itself nerves and nerve centres must have ended, in the plant, in the chlorophyllian function.'[3] 'The cardinal error which, from Aristotle onwards, has vitiated most of the philosophies of nature, is to see in vegetative, instinctive and rational life, three successive degrees of the development of one and

[1] *Creative Evolution*, p. 125. [2] *Ibid.* [3] *Ibid.*, p. 120.

the same tendency, whereas they are three divergent directions of an activity that has split up as it grew.'[1]

The Professor now passes to an examination of the two great life-channels of intelligence and instinct. 'Intelligence, considered in what seems to be its original feature, is the faculty of manufacturing artificial objects, especially tools to make tools, and of indefinitely varying the manufacture.'[2] Instinct 'is a faculty of using and even of constructing organised instruments.' Intelligence 'is the faculty of making and using unorganised instruments.'[3] Instinct is concerned mainly with matter: intelligence with forms. It is generally agreed by psychologists that the intellect works by establishing relations. Instinct plainly deals only with things upon which it reacts. In the attainment of knowledge, these two functions occupy therefore altogether separate provinces; the one seeking out the forms of things, the other the substance. 'There are things that intelligence alone is able to seek, but which, by itself, it will never find. These things instinct alone could find, but it will

[1] *Creative Evolution*, p. 142. [2] *Ibid.*, p. 146. [3] *Ibid.*, p. 147.

never seek them.'[1] It becomes important now to ascertain what class of questions are to be solved by intelligence, and what by instinct. 'Our intelligence, as it leaves the hands of nature, has for its chief object the unorganised solid.'[2] The tendency of the intellect being to fabricate, it can only deal with solids. Whatever is fluid will escape it in part, and life will escape it altogether.

In the next place, intellect cannot grasp mobility, but can only conceive it as a succession of stationary states. 'Of the discontinuous alone does the intellect form a clear idea.'[3] This is a grave drawback to the intellect as an instrument for 'pure theorising'; for 'movement is reality itself, and immobility is always only apparent or relative.'[4] And the intellect can only form a clear idea of this deceptive immobility. Hence it 'always behaves as if it were fascinated by the contemplation of inert matter,'[5] and is hopelessly bewildered when it turns to the living and is confronted with organisation. In such cases it can only proceed as if

[1] *Creative Evolution*, p. 159. [2] *Ibid.*, p. 162.
[3] *Ibid.*, p. 163. [4] *Ibid.* [5] *Ibid.*, p. 170.

this living matter were dead and inert, and in consequence it necessarily fails. 'The intellect is characterised by a natural inability to comprehend life.'[1]

Very different is it with instinct. 'While intelligence treats everything mechanically, instinct proceeds, so to speak, organically.'[2] The cell of an organic body is endowed with an instinct, indistinguishable from that of the bee in a hive. It contains within itself that fundamental vital push which connects it with all other branches of life. Life here is exactly like memory: the cell has bound up with it the knowledge of all the past. The wonderful instincts of animals are altogether beyond the explanations of science. If they were explicable for animals, they would not be so for plants, for 'how can we help thinking' that the movements of orchids to procure fertilisation, of the tendrils of climbing plants, are other than manifestations of instinct?[3] Instinct is sympathy, and to instinct we must look for an explanation of life. 'It is to the very inwardness of life that *intuition* leads us,—by intuition I mean instinct that has

[1] *Creative Evolution*, p. 174. [2] *Ibid.* [3] *Ibid.*, p. 179.

become disinterested, self-conscious, capable of reflecting upon its object and of enlarging it indefinitely.'[1]

From this point of view, then, consciousness appears as the motive principle of evolution, and man occupies a privileged position. 'Life, that is to say consciousness launched into matter, fixed its attention either on its own movement or on the matter it was passing through; and it has thus been turned either in the direction of intuition, or in that of intellect.'[2] With the aid of the conclusion thus reached, we are able to 'penetrate the most obscure regions of metaphysics.'[3]

We have now traversed in outline those portions of *L'Evolution Créatrice* which are not purely metaphysical. Of the rest, little need be said. The metaphysical atmosphere becomes so rarified as to approach perilously near being a vacuum. The reader has already probably begun to suffer from shortage of breath; and lest he should be totally asphyxiated, it will suffice to give the barest indication of the

[1] *Creative Evolution*, p. 186. [2] *Ibid.*, pp. 191, 192.
[3] *Ibid.*, p. 195.

remainder of the work. The Professor, having reached the point above described, proceeds to trace the genesis of intellect, and finds it to be cut off from intuition. 'Intuition is mind itself, and, in a certain sense, life itself.'[1] Philosophy has always failed when it has abandoned intuition. On intuition alone can we rely in dealing with life. The vital impetus appears to be closely allied to intuition. 'The whole of humanity, in space and in time, is one immense army galloping beside and before and behind each of us in an overwhelming charge, able to beat down every resistance and clear the most formidable obstacles, perhaps even death.'[2] It is again insisted that time is a concrete, and not an abstract quality. Duration is 'the very stuff of reality.'[3] An analysis of the idea of 'nothing' leads to the result that 'there is *more*, and not *less*, in the idea of an object conceived as "not existing" than in the idea of this same object conceived as "existing"; for the idea of the object "not existing" is necessarily the idea of the object "existing" with, in addition, the representation of an exclusion of this object by the

[1] *Creative Evolution*, p. 282. [2] *Ibid.*, p. 286. [3] *Ibid.*, p. 287.

actual reality taken in block.'[1] Motion is more than a mere series of positions through which the moving body passes. Yet this is the assumption of science which led Zeno to propound his paradox. The reality of motion in itself, and time in itself, can only be recognised by philosophy. The book terminates with a criticism of the philosophy of Herbert Spencer on the ground that it accepts the data of experience as a true reality. Spencer assumed mind and matter to *be* what they appear to our experience to be: he tells us nothing of what they really are, nothing really, therefore, of evolution. His method is the analysis and synthesis of matter: the splitting up and re-compounding of it, forgetting all about the real 'becoming.' 'Philosophy is not only the turning of the mind homeward, the coincidence of human consciousness with the living principle whence it emanates, a contact with the creative effort: it is the study of becoming in general, it is true evolutionism, and, consequently, the true continuation of Science—provided that we understand by this word a set of truths either experienced or demonstrated,

[1] *Creative Evolution*, p. 302.

and not a certain new scholasticism that has grown up during the latter half of the nineteenth century around the physics of Galileo, as the old scholasticism grew up around Aristotle.'[1]

After *L'Evolution Créatrice*, Bergson's most important work is *Matière et Mémoire.* Indeed, these are the only two among his philosophical works which have scientific pretensions, and are not purely metaphysics. It behoves us, therefore, to give a brief account of the doctrines of this work. Its object is to trace the relationship of mind and body; and in particular to attack the theory of psycho-physical parallelism which has been generally adopted by physiologists and psychologists, and which I shall describe in Chapter v. The theory is also attacked in the *Bulletin de la Société Française de Philosophie* for June 1901; but, the objections there raised being professedly metaphysical, an examination of them does not come within our purview, but may be left for those who hold that metaphysics is capable of reaching true conclusions.

Matière et Mémoire opens with a novel theory

[1] *Creative Evolution*, p. 391.

of perception, in which the Professor intends to reconcile realism with idealism.) For realists and idealists alike have postulated the existence of two quite different modes of experience, which in common language are termed subjective and objective. The difference between mind and matter has appeared to be a gulf which cannot be bridged. Bergson herewith undertakes to bridge it. Physiologists have discovered that whenever we have a perception of some external object, there takes place a nervous disturbance in sense-organ and brain; and that the cerebral disturbance is a condition of the existence of the mental perception. From this it has been inferred that 'perceptions' are localised within the brain. But Bergson denies the inference; he affirms that our perceptions of objects are not in ourselves, but are actually in the objects perceived. Moreover, there is no qualitative difference between perception and object. The perception is actually a part of the object, differing from it only in the fact that whereas an object has unlimited capacities for acting on other objects, the perception *selects* only one or two of these capacities for action—those, namely, which have

an interest for the perceiving individual. The perception, in short, is apparently the object itself, deprived of all its qualities, save the few that have for us a practical interest.

The Professor begins by deductively showing that mere physical cerebral disturbances cannot beget images of an external world, as has hitherto been alleged by physiologists. 'The brain is a part of the material world; the material world is not part of the brain. Eliminate the image which bears the name material world, and you destroy at the same time the brain and the cerebral disturbances which are parts of it. Suppose, on the contrary, that these two images, the brain and the cerebral disturbance, vanish: *ex hypothesi* you efface only these, that is to say, very little, an insignificant detail from an immense picture. The picture in its totality, that is to say the whole universe, remains. To make of the brain the condition on which the whole image depends is in truth a contradiction in terms, since the brain is by hypothesis a part of this image. Neither nerves nor nerve centres can, then, condition the image of the universe.'[1]

[1] *Matter and Memory*, p. 4.

Bergson then goes on to argue that the body cannot give rise to perceptions, but is merely an arrangement for the transmission of movement. 'My body, an object destined to move other objects, is, then, a centre of action; it cannot give birth to a representation.'[1] The purpose of the body is to provide a centre of choice as to which of several possible reactions to a stimulus shall take place. The brain is concerned only with motor reactions of an automatic character. 'There is then only a difference of degree—there can be no difference in kind—between what is called the perceptive faculty of the brain and the reflex functions of the spinal cord. The cord transforms into movements the stimulation received; the brain prolongs it into reactions which are merely nascent; but, in the one case as in the other, the function of the nerve substance is to conduct, to coordinate or to inhibit movements.'[2] It is to be observed that Bergson starts his discussion, not from matter, as is always done in physical science, but from spiritual 'images' which constitute the data of the whole argument. The images, which con-

[1] *Matter and Memory*, p. 5. [2] *Ibid.*, p. 10.

stitute for each of us the material world, cannot be created by the brain, which is itself an image. The function of the brain is that of a 'central telephonic exchange':[1] its special purpose being to present as many alternative outlets as possible to a received stimulus. Perception symbolises 'indetermination' in the means of outlet. The richer the perception the greater is the individual's power of choice among the various possible reactions furnished by the nervous system. 'Here is the image which I call a material object; I have the representation of it. How comes it that it does not appear to be in itself that which it is for me? It is because, being bound up with all other images, it is continued in those which follow it, just as it prolonged those which preceded it. To transform its existence into representation, it would be enough to suppress what follows it, what precedes it, and also all that fills it. . . . I should convert it into representation if I could isolate it, especially if I could isolate its shell. Representation is there, but always virtual—being neutralised at the very moment when it might become

[1] *Matter and Memory*, p. 19.

actual, by the obligation to continue itself and to lose itself in something else. To obtain this conversion from the virtual to the actual it would be necessary, not to throw more light on the object, but, on the contrary, to obscure some of its aspects, to diminish it by the greater part of itself, so that the remainder, instead of being encased in its surroundings as a *thing*, should detach itself from them as a *picture*.'[1] Representation results from the omission from the totality of matter of all that is devoid of interest for us. Our bodies are 'centres of indetermination,'[2] introducing a wholly new element into the physico-chemical sequences of matter constituting causality. The higher our power of representation, the more indetermination are we able to introduce in material phenomena, and the more are we able to restrict ourselves to those activities of external matter which are especially serviceable to us.

Bergson regards perception, therefore, as independent, theoretically at least, of nervous system and sense organs. He now has to explain why nerve lesions produce abolition of

[1] *Matter and Memory*, pp. 27, 28. [2] *Ibid.*, p. 28.

perception. If perception is not founded upon cerebral disturbances, how is cerebral injury capable of affecting the power of perception, as we know it does? The answer is that cerebral injury, by breaking the automatic circuit, prevents the motor reaction, determined by the will, from taking place. There would, therefore, be no purpose for a perception: it would no longer have any interest for us. 'The office of the nervous system is to utilise that [nerve] vibration, to convert it into practical deeds, really or virtually accomplished. If, for one reason or other, the disturbance cannot pass along, it would be strange if the corresponding perception still took place, since this perception would then connect our body with points of space which no longer directly invite it to make a choice.'[1]

Another difficulty to be met is this: perception shades gradually into affective states. 'We pass insensibly from the contact with a pin to its prick.'[2] Now pain is apparently a non-spatial subjective sensation in the body. If, then, perception is spatial and in the object outside the body, there must be a radical difference, not

[1] *Matter and Memory*, pp. 39, 40. [2] *Ibid.*, p. 53.

only of degree, but of kind, between perception and affection. To settle this difficulty Professor Bergson affirms that pain does in fact exist in the spot where it is felt, and that it is a local effort to repair damage. Pain 'is nothing but the effort of the damaged element to set things right,—a kind of motor tendency in a sensory nerve. Every pain, then, must consist in an effort,—an effort which is doomed to be unavailing.'[1] Now in practice, perception is never obtained in a pure state: it is always alloyed with a certain amount of affection, and this affection being possessed of local extensity, is readily transferable into perception. Perception being outside the body is not destroyed, like affective sensations, when the body is destroyed. 'The totality of perceived images subsists, even if our body disappears, whereas we know that we cannot annihilate our body without destroying our sensations.'[2] This is the more obvious, since between 'perception of matter and matter itself there is but a difference of degree and not of kind, pure perception standing towards matter in the relation of the part to the whole.'[3]

[1] *Matter and Memory*, p. 56. [2] *Ibid.*, p. 59. [3] *Ibid.*, p. 78.

If perception is strictly objective, it is radically different from memory which is purely subjective. The two, moreover, are always found in combination, rendering the confusion very difficult to avoid. 'The proper office of psychologists would be to dissociate them, to give back to each its natural purity; in this way many difficulties raised by psychology, and perhaps also by metaphysics, might be loosened.'[1] Just as perception throws light on the nature of matter, so memory is of cardinal importance in the study of spirit. Materialism is refuted by a true theory of memory. If memory is purely a function of cerebral activity, then materialism would be justified. If, on the other hand, it has an independent existence, that discovery is of great assistance in the solution of metaphysical problems. To this question the Professor now addresses himself. I must warn the reader again that I am still merely citing Bergson's views, without staying to criticise or contradict them.

The first fact that transpires is that memory exists, not under one form as the uninitiated might suppose, but under two wholly different

[1] *Matter and Memory*, p. 72.

forms. From the foregoing account three hypotheses are deducible :—

'I. The past survives under two distinct forms: first, in motor mechanisms; second, in independent recollections.'

'II. The recognition of a present object is effected by movements when it proceeds from the object, by representations when it issues from the subject.'

'III. We pass, by imperceptible stages, from recollections strung out along the course of time to the movements which indicate their nascent or possible action in space. Lesions of the brain may affect these movements, but not these recollections.'[1]

The character of the two forms of memory must be further specified. The first is that already known to psychologists—and generally believed by them to be the sole kind of memory—it is a 'cerebral mechanism' or 'habit of body.' When an impression or sensation has once been experienced, it modifies the cerebral substance in such way that the same experience may be recalled or reproduced by an appropriate stimulus

[1] *Matter and Memory*, pp. 87 and 88.

or association. Memory in this sense is the same as habit. It is exemplified in learning a thing by heart. Increased facility comes with every repetition: the explanation is wholly materialistic. Speaking figuratively, the passage once adopted through the brain becomes automatically more permeable every time it is traversed. Finally, the first word of a poem may automatically lead to rattling off all the rest, even while the individual is thinking of something else.

The other form of memory is purely psychical and has no physiological counterpart. The actual learning by heart is automatic and physiological: the recollection of each individual lesson is a function of the independent memory. The first only *acts* the part: the second *remembers* it. The one is an action, the other a representation. The first is the only form of memory possessed by the lower animals. The second is the privilege of man alone, though even with him it is apt to be thwarted by the other.

The first or habit-memory appears to be subject to the ordinary laws of association: but at times it calls to its assistance the other memory

which works by forming images of the past. Life is usually carried on by the habit-memory alone; but the image-memory is waiting in the background in case it is called upon to be of service. 'Suppose an accident which upsets the equilibrium maintained by the brain between the external stimulation and the motor reaction, relax for a moment the tension of the threads which go from the periphery to the periphery by way of the centre, and immediately these darkened images come forward into the full light.'[1] Bergson sums up his sketch of the two memories as follows:—'The past appears to be stored up, as we had surmised, under two extreme forms: on the one hand, motor mechanisms which make use of it; on the other, personal memory-images which picture all past events with their outline, their colour and their place in time. Of these two memories, the first follows the direction of nature; the second, left to itself, would rather go the contrary way. The first, conquered by effort, remains dependent upon our will; the second, entirely spontaneous, is as capricious in reproducing as it is faithful in preserving. The only

[1] *Matter and Memory*, p. 97.

regular and certain service which the record-memory can render to the first is to bring before it images of what preceded or followed situations similar to the present situation, so as to guide its choice; in this consists the association of ideas. There is no other case in which the memory which recalls is sure to obey the memory which repeats. Everywhere else, we prefer to construct a mechanism which allows us to sketch the image again, at need, because we are well aware that we cannot count upon its reappearance. These are the two extreme forms of memory in their *pure* state.'[1] Though distinct in kind, they may, however, coalesce in life.

The point really important to grasp in the present discussion is that Bergson postulates a purely psychical memory, independent of and in addition to the habit-memory already recognised by science. It is in this postulate that he parts from the generally received scientific view. He proceeds to attack the theory that the brain is a storehouse of mental images, from a variety of points of view. Taking auditory images as an example, the image of a word is not a well-

[1] *Matter and Memory*, pp. 102, 103.

defined and fixed thing, but varies slightly in pronunciation, etc., every time it is heard. On the hypothesis that the brain stores up images, 'you must assume that there are as many auditory images of the same word as there are pitches of sound and qualities of voice. Do you mean that *all* these images are treasured up in the brain?'[1]

Bergson tells us that sensory aphasia also throws discredit on the physiological hypothesis. 'If memories are really deposited in the cortical cells, we should find in sensory aphasia, for instance, the irreparable loss of certain determined words, the integral conservation of others. But, as a matter of fact, things happen quite differently.'[2] What happens is that there is a general weakening of the function, without any diminution in the number of recollections. In the true aphasias, where the memory of words is completely lost, the failure begins with proper nouns and ends with verbs. 'We could hardly explain it if the verbal images were really deposited in the cells of the cortex; it would be wonderful indeed that disease should

[1] *Matter and Memory*, p. 147. [2] *Ibid.*, p. 149.

always attack these cells in the same order. But the fact can be explained, if we admit that memories need, for their actualisation, a motor ally, and that they require for their recall a kind of mental attitude which must itself be engrafted upon an attitude of the body. If such be the case, verbs in general, which essentially express *imitable actions*, are precisely the words that a bodily effort might enable us to recapture when the function of language has all but escaped us; proper names, on the other hand, being of all words the most remote from those impersonal actions which our body can sketch out, are those which a weakening of the function will earliest affect.'[1] Bergson then goes on to argue that introspection gives the same conclusion. He sums up his conclusions as follows:—'We have distinguished three processes, pure memory, memory-image, and perception, of which no one in fact occurs apart from the others. Perception is never a mere contact of the mind with the object present; it is impregnated with memory-images which complete it as they interpret it. The memory-image, in its turn, partakes of the

[1] *Matter and Memory*, pp. 151, 152.

"pure memory," which it begins to materialise, and of the perception in which it tends to embody itself; regarded from the latter point of view it might be defined as a nascent perception. Lastly, pure memory, though independent in theory, manifests itself as a rule only in the coloured and living image which reveals it.'[1] It is associationism that is singled out by Professor Bergson for special attack. He condemns it on the ground that it splits up the mind into isolated elements, lying inertly beside each other, remote indeed from the living reality which is a 'continuity of becoming.'

While arguing that pure memory is essentially detached from life, the question arises where the memories are. If they exist *qua* memories, and if the theory that the brain contains them is false, where then are they located? A fallacy is involved in the very question. 'Let us admit for a moment that the past survives in the form of a memory stored in the brain; it is then necessary that the brain, in order to preserve the memory, should preserve itself. But the brain, in so far as it is an image ex-

[1] *Matter and Memory*, p. 170.

tended in space, never occupies more than the present moment; it constitutes with all the rest of the material universe, an ever renewed section of universal becoming. Either, then, you must suppose that this universe dies and is born again miraculously at each moment of duration, or you must attribute to it that continuity of existence which you deny to consciousness, and make of its past a reality which endures and is prolonged into its present.'[1] Finally, it is a fallacy to suppose that the past has ceased to exist; it still exists. The pure present consists only of 'the invisible progress of the past gnawing into the future.'[2] The past is not past in the sense of having ceased to exist, but only as having ceased to be useful. 'All the facts and all the analogies are in favour of a theory which regards the brain as only an intermediary between sensation and movement, which sees in this aggregate of sensation and movements the pointed end of mental life—a point ever pressed forward into the tissue of events, and, attributing thus to the body the sole function of directing memory towards the

[1] *Matter and Memory*, p. 192. [2] *Ibid.*, p. 194.

real and of binding it to the present, considers memory itself as absolutely independent of matter. In this sense, the brain contributes to the recall of the useful recollection, but still more to the provisional banishment of all the others. We cannot see how memory could settle within matter; but we do clearly understand how—according to the profound saying of a contemporary philosopher [Ravaisson]—materiality begets oblivion.'[1]

No more need be said. We have covered all those parts of Bergson's philosophy which profess to be connected with science: all therefore with which we are concerned in this book. It will be seen that both in *Creative Evolution* and in *Matter and Memory*, the brunt of Bergson's attack falls upon the so-called materialistic philosophy which is regarded as underlying science. In the evolution of life he attacks the naturalistic interpretation of Darwin and his successors. Their efforts were and are directed only to relating past events in the history of the world with careful accuracy. Bergson holds that a far more fundamental knowledge is possible than

[1] *Matter and Memory*, p. 232.

the mere recomposition of the past. So also he disputes the belief that mind can only exist in relation to matter, and that its laws are dependent upon the laws of matter. He contends for an absolute and independent mind or memory of purely psychical character, and without physical counterpart. To what extent those opinions are tenable will be the object of our further inquiry.

CHAPTER III

REASONS FOR DISSENTING FROM THE PHILOSOPHY OF PROFESSOR BERGSON

'. . . Because thy vision goes
Seeking to pierce too far this shadowy air,
In thy imagining an error grows.'

DANTE.

I HAVE endeavoured in the preceding chapter to present an impartial description of the theory, whose merits have now to be examined. In the succeeding chapter, I shall sketch the general tendencies discernible in the history of philosophy; for, although in the present chapter I confine myself wholly to Bergson's doctrines, yet many of the objections here raised to them would apply *mutatis mutandis* to the doctrines and methods of metaphysicians at large. The misuse of words, in particular, is a failing not at all peculiar to Bergson. It was characteristic of Greek philosophy, and was criticised by Demokritus, one of the greatest of the ancients. It was common everywhere at the revival of

philosophy, and was condemned in particular by Hobbes and Locke. In recent times, Spencer has attacked it; and it is still the mainstay of German metaphysics. At all times, English philosophy has been freer than Continental philosophy from the vice of misuse of language: and the present alliance of the two branches is far from favourable to the English.

Let me commence by an analysis of Bergson's method. There are three main types of fallacy constantly recurring throughout his works. The first is as follows: a certain set of facts requires to be explained, and there exist one or more rival theories for explaining them. Bergson examines these theories, and rejects them—often giving sound reasons for their rejection. Then invariably he produces his own theory, and without any further ado, assumes that it must be true, because the others are false. In future I shall refer to this as the mannikin fallacy. Its constant repetition is curious and interesting, when once it has been noted. Bergson seldom names a fact in support of his own doctrine. If the reader will glance at the facts given in his works, he will find that they are nearly all collected for

refuting other doctrines. The refutation finished, the reader finds on the next page that Bergson's own theory is in possession of the field. It is suddenly there, without any explanation and without any suggestion of evidence. It has risen like a phœnix from the ashes of its predecessors: and thenceforward it is treated as established truth. Now with regard to this method, it has to be observed that the destruction of one theory does not furnish a particle of evidence in favour of any other theory. There are various possibilities: the facts may not be susceptible of inclusion under any theory at all, in the present state of our knowledge. The facts dealt with by Bergson are for the most part concerned with abstruse subjects, in which I do in fact believe that very often no theory can be formed: ignorance must be confessed: yet, strangely enough, I can recollect no passage in Bergson's works in which there is a suggestion that we have reached the limits of knowledge. In the next place, supposing that the facts *can* be covered by some theory, it may be an altogether different theory from any that has previously been thought of. In the third place, Bergson's

refutations of existing theories are often incomplete. The only way in which a theory can be established is by definite facts in its favour. A refutation of Buddhism is not a proof of Mahommedanism: for there are Christianity and sundry other religions with equal or greater claims to veracity.

Besides the mannikin fallacy, another that occurs with great frequency, is that of the false analogy. Analogy is at all times a dangerous guide: it is employed *ad nauseam* throughout Bergson's works. The skeleton of his reasoning is as follows: a set of facts is taken, requiring to be explained: he likens it to another set of facts, arbitrarily chosen. But about this new set of facts, some law holds good. Therefore it also holds good in the first set. Let me take an example of this paralogism from the Introduction to *Matter and Memory*. The Professor is arguing against the dependence of the mind on the brain; he continues:—'That there is a close connection between a state of consciousness and the brain we do not dispute. But there is also a close connection between a coat and the nail on which it hangs, for, if the nail is

pulled out, the coat falls to the ground. Shall we say, then, that the shape of the nail gives us the shape of the coat, or in any way corresponds to it? No more are we entitled to conclude, because the psychical fact is hung on to a cerebral state, that there is any parallelism between the two series, psychical and physiological.'[1] The analogy begs the whole question. In what does the connection between mind and body resemble the connection between a coat and a nail? The connection between coat and nail is admittedly contingent: the very fact of comparison *assumes* the contingency of the connection between mind and body, which is just what he wants to prove. Supposing that a different analogy had been taken, namely, the connection between the radius and circumference of a circle. This analogy would prove a rigid and absolute connection between mind and body: and it is just as well suited for comparison, as is the coat-and-nail connection. In short, if we resort to analogy at all, we must first prove the resemblance between the facts to be explained and their suggested analogue. If analogues are chosen at random,

[1] *Matter and Memory*, p. xi.

the conclusions arrived at will also be random; and by choosing one's analogies, one could prove any absurdity one wanted, and could disprove it with equal readiness.

The next point, to which we shall direct our attention, is the large number of questionable statements that are made in Bergson's works without any evidence, and are used as data for deduction. And finally there is his hopeless and irremediable misuse of language: throughout large sections of his work, the words are mere forms or sounds without significance behind them. Bergson's medium of expression is largely a false coinage: his verbal currency is heavily laden with counterfeits, cunningly made, and demanding careful testing before we let them pass. Of this I shall adduce many instances. With this preliminary caution, let us approach the body of Bergson's work.

I shall first deal with his declared belief that instinct, not intellect, is the appropriate guide for the discovery of vital phenomena. The proof of this remarkable statement involves the first of the fallacies above described. The intellect has failed in this, that, and the other department

of inquiry into vital phenomena: therefore the intellect is an erroneous guide: therefore instinct is a true guide. Now supposing I admit, as I most readily do, that intellect is very far from having explained vital phenomena, is it not a possibility that the reason lies in the complexity of such phenomena themselves—a complexity that may remain for ever beyond the reach of intellect, or may yield to fuller knowledge and wider powers? And if this supposition is false —if the intellect is in truth by its very nature incapable before the facts of life—why should it follow that instinct is more fortunate? It is a case of the mannikin fallacy. There is only one way of showing that instinct is a correct method; and that way is to supply facts which prove it. *Not one such fact is offered us.* Take the sciences which deal with life—biology and medicine. Every step in the progress of biology has been taken by intellect moving among ascertained facts: instinct has discovered nothing in biology; it is unknown, as a method, to the workers in that science. The same, and more also, may be said of medicine. Which of us would employ a doctor who had abrogated

science, intelligence, and all acquired experience, and proposed to treat us by intuition? The progress of medicine has been a history of the extrusion of *a priori* prejudices or intuitions by the results of science and experience. Dr. Stewart, in his *Critical Exposition of Bergson's Philosophy*, has attempted to defend the intuitive method by affirming that scientific discoveries are themselves instances of flashes of intuition. It is true, in spite of Newton's *Hypotheses non fingo*, that scientific progress depends upon lucky guesses, intuitions, or hypotheses. But no one ever attaches the slightest weight to such a guess, until it has been tested by facts. For one hypothesis, which proves to be correct, there have commonly been a very large number which have been found incorrect. Kepler had to abandon numerous hypotheses before he found the true one, giving the law of planetary orbits. Ehrlich is said to have formed and rejected over six hundred hypotheses before he discovered 'salvarsan,' which at last was found to meet the requirements. In short, the correct way is often only found after trying many possible incorrect ways. When, therefore, a philosopher urges upon us

the method of intuition, in a region where verification is impossible and facts unknown, we can only reply that he is talking arrant rubbish, and is applying a method which would speedily ruin any one who was so foolish as to adopt it in practical life. But the doctrine is capable of a more direct refutation. Bergson sets forth a theory of life supported by his intuition alone. Now I have a very distinct intuition that his theory of life is groundless : and, on the intuitive method, I submit that the fact of my intuition is a disproof of Bergson's philosophy. For, otherwise, Bergson must hold that his intuition is more valuable than mine, and those of all others who disagree with him : and he has not yet made any such claim.

Now let us deal with his theory of time. When a philosopher affirms on the second page of his chief work that 'there is no essential difference between passing from one state to another and persisting in the same state,'[1] we may reply that, if we are to believe that, there is simply no limit to the absurdities which might be founded on it. If it takes less than two pages

[1] *Creative Evolution*, p. 2.

to establish so monstrous a doctrine, surely there is nothing imaginable that might not be proved within the limits of four hundred. It is verbiage, and nothing more. On the same page we get another instance of the same kind: where the Professor affirms that his mental state, as it advances along the road of time, swells with the duration it accumulates, like a snowball rolling on itself. Now, here, Bergson has started with the idea of a snowball rolling along a road and getting bigger—a conception true to nature. He then makes use of the false analogy. For 'snowball' he substitutes 'personality'; for 'snow' he substitutes 'time'; and he thinks of a sort of round personality rolling along getting big with time. But unfortunately it is no longer a true conception: it is mere words, meaning nothing. Supposing, however, we concede some esoteric meaning, the analogy would still be false; for he makes no attempt to show what property personality has in common with snowballs, nor what common property have time and snow. The analogy is silently assumed: I deny the assumption, and I ask for proof that any analogy exists.

A little farther on it is stated that 'we readily perceive'[1] that psychical life is made of time, which is a stuff both resistant and substantial. I perceive nothing of the kind, readily or unreadily. If time is a substantial stuff possessing resistance, it should be possible to prick it with a pin, or to analyse it chemically, or put a little in one's pocket. Again we see the use of the false analogy: facts holding true about matter are transferred to 'time,' and the verbal analogy is so obsessing, that Bergson omits to observe that his words are false coins, bearing no meaning. Forthwith we are introduced to the conception that life is a current running through matter. A visible current has taken rise at a certain time and place, and organises matter as it advances. Now this is an analogy which may or may not be useful. It is assumed to begin with; and throughout the rest of the chapter Bergson argues as if it were the facts themselves, instead of being merely an analogy. The Professor has before his mind the image of a stream running along the surface of the Earth, and breaking up into a number of separate

[1] *Creative Evolution*, p. 4.

channels. For the stream he substitutes life; for the separate channels he substitutes genera and species. The analogy is purely arbitrary: any other would have done as well: no attempt is made to prove its relevance: but propositions founded on the idea of streams and deltas are thenceforward shamelessly transferred to life and species. But now comes a very interesting illustration of Bergson's methods. We are told that 'the more we fix our attention' on this continuity of life (the channels being all integral parts of the main stream) 'the more we see' that it resembles the evolution of a consciousness, in which past presses against present, etc., etc.[1] As it has never been my good fortune to witness the 'evolution of a consciousness,' I am unable to judge what sort of a process that may be: if its main feature is the hustling of the present by the past, it must be curious and entertaining to watch. But the important point is that by this analogy 'spirit' is made the basis of the Universe. I do not wish at present to attack that belief: I merely wish to point out that the proof upon which Bergson rests it, is that

[1] *Creative Evolution*, p. 29.

the more we fix our attention on it, the more shall we perceive it. This is a substitute for facts which cannot be admitted. I find, on the contrary, that the more I fix attention on it, the less I perceive it. Bergson affirms that life is something more than an abstraction, comprising all living creatures. Well, if it is something more, we ought to have facts to prove it. We know of life only as implying living things; and if there is a life in the abstract, we should be directed how to find it. But we are not. All we get is the wretched analogy with a stream, begging the whole question. If life *is* a stream, then of course there is a 'life' apart from living creatures. But the whole question is, whether it is. It is no good telling us to think hard about it; facts are required and facts alone: no amount of thinking is of any use unless we have material to think with. Bergson thinks with words, but we must demand solid facts. The mediæval realists thought that a general term, or generic name, was an actual thing, over and above the units it comprised. They defined a hatchet as the union of the raw metal with the principle of 'hatchetness.' Bergson similarly assumes an

independent 'life'; and explains living organisms by affirming that they are merely portions of dead matter united to an independent vital principle. Would it not be logical to go the whole way like Abelard of old, and say that just as man is inert matter endowed with the independent entity 'life,' so individuals are simply men endowed with a further and still more particular entity peculiar to themselves, *e.g.* that Sokrates was the union of 'man' with Sokratity, and Plato of 'man' with Platonity?

Having got to a substantial and active 'life' and 'time,' Bergson uses them to some purpose for the refutation of the physico-chemical theory of the Universe. That theory, he freely confesses,[1] is irrefutable by scientific methods. The only mode of refuting it is from the 'consideration of real time': that is, not the mere passage of minutes that the plain man understands as time, but *real* time,—the strange metaphysical substance we have just been discussing, and the same sort of thing as 'life.' Granting the existence of 'real time,' we are fully prepared to believe that it is outside the laws of physics and

[1] *Creative Evolution*, p. 39.

chemistry. But where is this real time upon whose solid corners science vainly breaks its head? Huxley was the most famous modern defender of the scientific position; but, says Bergson, there was one flaw in Huxley's argument: he overlooked 'real time': the time he spoke of *did* nothing. Well, as soon as I see time *doing* something, I shall gladly abandon Huxley's position. The criticism, which I can scarcely believe to be otherwise than frivolous, is a surrender of the whole position of metaphysics. Time is an abstraction: no doubt, organisms grow old, and we speak of time having aged them. But we do not mean that time is an actual factor in the process: all that we mean is that their natural growth has carried them towards decay. Natural growth is an affair of time; and we speak, by analogy, of time having wrought the change. Probably few besides Bergson would ever be taken in by such a method of speaking. Since, by Bergson's admission, this is the only argument that can refute mechanism, we can hope for nothing better in the interests of the mechanistic theory, than a wide circulation of Bergson's works.

Let me place the matter a little differently. Huxley was referring to the reconstruction of past events, and the possibility of prophesying future events. He stated, in brief, that with a complete knowledge of the laws of physics, mechanics and chemistry, and with an infinite mathematic, the future could be prophesied in detail. Bergson replies that he has omitted to reckon with 'real time.' Now prophecy has already reached a high efficiency in astronomy. Do astronomers reckon 'real time,' or do they rely purely on mathematics and physics? In chemistry the periodical classification has enabled the existence and properties of elements to be prophesied, long before they were discovered. What has 'real time' got to do with it? In medicine, a doctor can prophesy the course of a disease without any attention to the vagaries of 'real time.' In all the affairs of practical life, we have to look into the future and make arrangements for our daily needs: in all these cases we assign no active rôle to time: it is nothing but a name for the succession of events: if it were liable to upset our arrangements, life would become impossible. Now the facts re-

ferred to by Huxley are just such ordinary facts as these, though not so completely under our noses. If 'real time' is negligible in the one case, it is negligible in the other. If we have never witnessed 'real time' in practical life, it is folly to assume it for evolution. Biologists try to explain evolution by reference to forces which everybody can understand and experience. To explain it by reference to a new force which nobody can understand or experience, is the same thing as not explaining it at all. But to allege this ghostly force in contradiction to the operation of known laws is such fantastic folly, as to demand ridicule rather than serious comment. What does Bergson mean by saying that 'we cannot sacrifice experience to the requirements of a system'?[1] He suggests that Huxley has done so: being apparently unaware that no man on earth would have been so little likely to make such a mistake. What experience is sacrificed? What system compelled him to sacrifice it? The habit of using words without any significance is almost a disease with Bergson; as soon as a phrase

[1] *Creative Evolution*, p. 41.

comes to his mind, which sounds well, it all goes down into his philosophy with its meaning never once considered. I need hardly add that the suggestion as to Huxley's attitude is false: for Huxley adhered to no system, and formed his views solely from experience.

Having stated that mechanism is only refutable by considerations of real time, the Professor some twenty pages farther on, proceeds rather inconsistently to offer a refutation of it on quite other grounds, far more comprehensible. It appears that he holds 'radical mechanism' in such abhorrence that even after admitting it cannot be refuted, he cannot resist the attempt to refute it. I call the reader's very special attention to this refutation: for once we are free of metaphysics, the argument can be understood, the words bear a meaning. We can at last form an opinion of what Bergson looks upon as proof.

We are told that if it can be shown that two divergent lines of evolution result in precisely similar structures, mechanism will be refuted. We are given a concrete instance: a real solid fact, of which let us make the most. We are asked to con-

sider the eye of Pecten, which is a mollusc, and compare it with vertebrate eyes. They both possess cornea, lens, and structural resemblances of a close character. If we go far enough back we doubtless find that molluscs and vertebrates spring from a common stem; but they diverged long before eyes of complexity were developed. Hence these complex organs have independently evolved in similarity with one another. Physical forces, working at hazard, could never produce so remarkable a coincidence. Therefore mechanism is false! Therefore Bergsonism is true! and so our philosopher goes paralogising off into the distance. It is an admirable illustration of the mannikin fallacy. Let me criticise, in turn, each step in the argument.

In the first place, is it so very wonderful that similar organs should have been reached by divergent lines of evolution? After all, if we go far enough back, molluscs and vertebrates had a common ancestry, even though it was before the days of eyes. The protoplasm from which they were derived possessed, I suppose, capacities for evolving in certain directions, and has been exposed to similar environments. Why should

they not develop parallel to one another? It is no use talking of the strangeness of it; it is not more strange than the pattern on a peacock's tail, or than any other of the wonderful facts of biology. I see no more difficulty in accounting for it by natural selection than in accounting for any other structure. But let us grant Bergson's contention for the sake of argument: let us suppose that it cannot be accounted for by Darwinism, or by mutations, or by neo-Lamarckism, or by any other biological theory. What then? all we can do is to say that there it is, and we cannot at present account for it, and perhaps never shall be able to account for it. But this is no comfort to metaphysics. Bergson makes use of the first fallacy to which we drew attention. Alleging that this, that, and the other mechanistic hypothesis fails, he *assumes* that all mechanism is at fault, and he *concludes* that his own doctrine is true. But there may be many other mechanistic modes of evolution, not yet discovered. Mechanism is not condemned because some of its hypotheses are false. If that were sound logic, metaphysics indeed would be in a bad strait; for presumably Bergson condemns

all the other systems but his own. And if all possible mechanistic hypotheses were exhausted, so that we were thrown back on metaphysics, why should it follow that Bergson's is the true theory? Why not Spinoza's? Why not Leibnitz's? Why not the next metaphysician of a future age? No facts are given for Bergson's explanation. All we get is this: 'We cannot help believing that these differences are the development of an impulsion,'[1] etc.: in short, it is the stream of life, with which we are now familiar, once again. I *can* help believing: still more, I can by no effort bring myself to believe in this stream of life, which I have endeavoured to show is a hollow verbalism. Still more interesting a light on Bergson's methods is thrown by the next step in his argument. The simple reader has perhaps gulped down the stream of life with some difficulty: before getting much farther, he suddenly finds the word 'psychological' put in, in an entirely unobtrusive manner. The Pecten's eye not only proves a stream of life, but proves that that stream is of psychological character. There is not a solitary word of justification for the intro-

[1] *Creative Evolution*, p. 90.

duction of the psychical character: no attention is paid to the point whatever: but the reader slowly becomes aware that this stream has become psychological. At first he did not know what it was: it was just a stream of life, without thinking too hard what sort of thing that might be. Now it is a psychological stream, all of a sudden—*and not a single shadow of a fact to prove it!* The stream is making conscious efforts to get along: it struggles against matter: it does all sorts of things much more wonderful than any Pecten's eye; and the proof all rests in the circumstance that Pecten has an eye like a vertebrate. Absurdity upon absurdity is piled high on the unfortunate Pecten.

In point of fact, there appears to be nothing peculiarly astonishing about the resemblance of eyes. The focusing of light is not a thing that can be done in innumerable different ways; I cannot myself think of more than three possible methods: a lens, a mirror, or a pinhole; and of these a mirror seems hardly practicable. Supposing that there are only two alternatives, it is mathematically an even chance whether molluscs and vertebrates developed the same

kind of eye, or different kinds. A mathematician who knew what a vertebrate eye was like, but not what a molluscan eye was like, would have been prepared to bet as readily on its being the same as being different, in principle.

I understand that the reason why the stream of life is competent to make eyes, is that it has an eye-making branch. Wherever this particular eye-runnel from the main stream of life has pushed far through matter, the resulting eye is complex: where it has gone but a short distance, the eye is simple. But the runnel makes only one kind of eye wherever it goes: hence in such remote animals as molluscs and vertebrates we find the same structure. All appears to be explained. Yet all is not explained. For there exists a tiresome animal called the Pearly Nautilus which has no lens, but just that pin-hole-camera eye, which, excluding mirrors, appears to be the one possible alternative. It is essential to Bergson's theory that vision, or the eye-runnel, should only make one sort of eye. 'No matter how distant two animal species may be from each other, if the progress towards vision has gone equally far in both, there is the same visual

organ in each case.'[1] Now the eye of the Pearly Nautilus endows that animal with vision: yet is of totally different structure from molluscan or vertebrate eyes: the difference, not being merely one of lesser development, but of kind. Will Bergson tell us that there is another runnel from the life-stream whose special business is making eyes for Pearly Nautiluses? I confess I see no more objection to that hypothesis than to any of the preceding hypotheses. But the matter is worth mentioning: since if, as the Professor maintains, 'Vision' is a single elementary 'life-tendency' which makes a certain kind of eye wherever it goes, there must either be two kinds of visions and two separate 'life-tendencies': or else the Pearly Nautilus will have to fall back on Darwinian principles for the evolution of his eye, and if the Pearly Nautilus can grow an eye on materialist lines, why not Pecten?[2]

[1] *Creative Evolution*, p. 101.

[2] Before leaving this part of the subject, we may draw attention to Bergson's statement that there is a certain amount of truth in the evolution theories of Darwin, of De Vries, and of Lamarck, since each of them is 'supported by a considerable number of facts.' The assertion that each is 'true in its way' is a metaphysical absurdity: for the theories are mutually contradictory, and therefore not more than one of them can be true. The facts

Having now established his vital impetus or life-current on a foundation of security, Bergson proceeds to trace its various branches. There is nothing very novel to say about this part of his work. The false analogy of a vital stream is carried out into details: great numbers of propositions are made concerning it, without any evidence whatever being offered for them. We are informed *ex cathedrâ*, that the resistance of inert matter was the obstacle to be overcome by the vital impetus. We ask for evidence: there is none. We are told that life overcame the obstacle by humility and making itself very small. Again we ask for evidence: again there

on which the others are based are deceptive, and must be interpreted by some new explanation. But even if this were not so, I object to the expression 'true in its way.' There is in science only one way of being true, and that is when the theory is an accurate statement of the facts. If, for instance, the experiments of Brown-Séquard appear to support Lamarckism, it is no solution to conclude that Lamarckism is 'true in its way'; Lamarckism is either true or not true: if (as I believe) it is not true, the reason is that Brown-Séquard's facts are susceptible of another explanation, or else that they are insufficient by themselves to do more than give an air of probability or possibility to a theory, discredited by other facts. The support of a limited number of facts does not imply partial truth of a theory, but probability only. As the number of facts increases the probability may rise to certainty; or a contradictory fact may turn up completely destroying the probability erected by the others.

is none. But here again the words are unintelligible: they are false counters. To talk of a stream being humble, or making itself small is in practical life a *façon de parler*, meaning only that it is a tiny current. Again, regarding life as an effort, we do certainly speak of an effort being humble: and by this we mean a small effort, not aiming at any great results. Now, how are obstacles to be overcome by small efforts, when great efforts have failed? If the vital impetus finds obstacles in its way, I cannot see how those obstacles can be overcome by reducing the force of the impetus. Yet that is the only possible meaning that the Professor's words can carry. We are of course here in the presence of another of his elegant analogies, which sound so pretty that he has never gone down to the meaning or intelligibility of the words.

We are informed that the true causes of differentiation are 'those which life bore within its bosom.'[1] How can an impetus have a bosom? I do not wish to be captious, but Bergson moves in a world of fancy metaphors, which must be torn ruthlessly away when the

[1] *Creative Evolution*, p. 104.

discussion purports to be scientific. The poetic licence which we might pass in Omar Kayyám becomes in science superfluous verbiage, serving only to obscure facts.

The vital current did not stop when it had made primitive animals, as it might have done. It was good enough to work on in three main divisions — plants, hymenoptera, and men; characterised by torpor, instinct, and intelligence. Now Bergson would doubtless recognise that this tripartite division of the organic world is new to biology. There is no sign that these are the three main roads of evolution, others being merely byways. I fail to see why there is no main road ending in birds, with the characteristic of mobility—especially as we are informed that 'between mobility and consciousness there is an obvious relationship.'[1] We see here the difference between the methods of science and metaphysics. Science examines all species of organisms, and classifies them in numerous groups according to their resemblances. Metaphysics starts with *a priori* conceptions of the main groups—in this case groups characterised by

[1] *Creative Evolution*, p. 115.

torpor, instinct, and intelligence—and *then* looks at the organisms, declaring that those exhibiting these characteristics are the main goals of evolution. The metaphysical method is wholly *a priori*: the scientific method almost wholly *a posteriori*. Again, the suggestion that sexual reproduction is a necessity for animals, and only a 'luxury' for plants is wholly *a priori*, set forth because, were it true, it would be convenient to Bergson's theory. And what is meant by 'luxury' here? Are we meant to understand that plants enjoy the process of sexual reproduction, and therefore have clung on to the habit in spite of its inutility? Or are we merely moving among phantom words without a body? Take this statement again: that animal evolution, rather than plant evolution, indicates 'the fundamental direction of life.' What does he mean by 'fundamental'? Evolution has, we know, moved in the two main directions of animal and plant. That is an ultimate fact, learnt by observation. What is added to our knowledge when we are informed that one direction is more 'fundamental' than the other? It is like saying that the road to Kensington is more fundamental

than the road to Hampstead. It may be a broader road, or a better-made road, or a longer road, but how can it be a more 'fundamental' road? Probably Bergson means that the Life-stream has endeavoured to travel along the animal series, and that the plant kingdom is a by-product rather than a conscious result of its activities. So too, among animals, it is man that Life has been aiming at, in particular. Very flattering for us, no doubt: but where are the facts which redeem the doctrine from the charge of gross anthropocentricity?

I now reach the discussion about instinct and intelligence which I have already criticised, and have nothing to add to it save on one small point. Bergson asks how we can help thinking that the movements of orchids to procure fertilisation and the tendrils of climbing plants are other than manifestations of instinct. This is only one instance among a very large number occurring everywhere throughout his works when a highly dubious proposition is ushered in by the phrase 'we cannot help thinking that,' or 'the more we reflect upon it, the more we shall see that.' To deal with the statement about

orchids and climbing plants, we should first require an exact definition of instinct. Exact definitions being in no demand in metaphysics, I really do not know what the sentence means. If by 'instinct' is meant mere automatic reaction to stimulus, we might accept it. If anything psychical is intended, we emphatically reject it. Not only can we very easily 'help believing it,' but we cannot by any effort bring ourselves to believe in it: for we only know of consciousness in relation to a nervous system, and there are no signs of a nervous system in orchids or in climbing plants.

I have attempted to criticise the principles of Bergson's philosophy. If my criticisms have been just, it is but little use carrying the process any further, for the utter demolition of the basis destroys the superstructure at the same time. I shall therefore not systematically follow the philosophy further, but only draw attention *seriatim* to a number of isolated doctrines which throw further light on Bergson's method.

'Life in general is mobility itself.'[1] I disagree; life is an abstract term, generalising the peculiar

[1] *Creative Evolution*, p. 134.

attributes of living organisms; mobility is another abstract term, generalised from moving bodies.

Maternal love 'may possibly deliver us life's secret. It shows us each generation leaning over the generation that shall follow. It allows us a glimpse of the fact that the living being is a thoroughfare.'[1] False analogy: a mother leans over her baby, giving rise to the conception of one generation leaning over another; this latter conception is like saying that the figure 4 leans over the figure 5. Moreover, a living being is not a thoroughfare, but a living being. The analogy is likely to appeal to many people on account of its æsthetic beauty. We are here, however, discoursing about facts, and beauty is merely a distraction.

Bergson's attempt to establish the pre-eminence of men and hymenoptera takes, in one place, the following form:—'It is unquestionable that *success* is the most general criterion of superiority, the two terms being, up to a certain point, synonymous. By success must be understood, so far as the living being is concerned, an

[1] *Creative Evolution*, p. 135.

aptitude to develop in the most diverse environments through the greatest possible variety of obstacles so as to cover the widest possible extent of ground. A species which claims the entire earth for its domain is truly a dominating and, consequently, superior species. Such is the human species, which represents the culminating point of the evolution of the vertebrates. But such also are, in the series of the articulate, the insects, and, in particular, certain Hymenoptera. It has been said of the ants that, as man is lord of the soil, they are lords of the subsoil.'[1]

Under this definition, birds ought to be a dominating group, for their distribution is wider than that of men. And the most pre-eminent species of all would not be men, or insects, or even birds, but those simple unicellular creatures like *amœba*, which are found everywhere all over the earth.

'If the intellect were meant for pure theorising, it would take its place within movement, for movement is reality itself, and immobility is always only apparent or relative.'[2] This is an extreme instance of word-juggling. The

[1] *Creative Evolution*, pp. 140, 141. [2] *Ibid.*, p. 163.

obscurity of the verbiage envelops the main proposition in such a fog that the critic can see nothing at all. Movement and immobility, or motion and rest, are relative terms: it is improper to call one real and the other relative. Nor do I understand how the intellect is 'meant for' anything, except on the hypothesis of current theology, which is not what Bergson means. Again, intellect taking its place within movement is a conception I am unable to frame.

'Insect societies probably have a language.'[1] No evidence is offered for a supposition which is highly improbable.

'Instinct is knowledge at a distance. It has the same relation to intelligence that vision has to touch.'[2] Why, then, do we owe our knowledge of the stars to intelligence, and not to instinct? Why has Astronomy advanced by the gradual triumph of intelligence over bigoted superstition?

The theory of the neo-Darwinians is condemned on the ground that natural selection of minute variations is 'absolutely incapable of explaining instincts.'[3] Instincts are no harder

[1] *Creative Evolution*, p. 166. [2] *Ibid.*, p. 177. [3] *Ibid.*, p. 178.

to explain than structure. Indeed, instinct is rigidly dependent upon structure. If an animal instinctively performs an action, the reason is that its nervous system is so constructed that certain stimuli produce certain appropriate reactions. Instinct is based on nerve structure: if natural selection can mould the shape of an animal's limbs, it can also mould its nervous system, comprising instinct therein.

In the evolution of instinct 'no one will maintain that chance could perform such a miracle; in one form or another we shall appeal to intelligence. We shall suppose that it is by an effort, more or less conscious, that the living being develops a higher instinct.'[1] That evolution proceeds by selection of favourable *chance* variations is, in opposition to Bergson's statement, the opinion of the majority of those competent to judge. But supposing it to be erroneous, that fact affords no evidence whatever in favour of 'intelligence' having created instinct: still less that the living being made an effort: and still less again that that effort was conscious. The instance is a good one of the

[1] *Creative Evolution*, p. 179.

mannikin fallacy: where Bergson, after a fancied refutation of a hostile theory, assumes that his own is thereby established in the full details of its manifold absurdity.

The well-known case of the Ammophila wasp is taken from Fabre's *Souvenirs entomologiques.* This wasp is in the habit of stinging caterpillars over certain nerve-centres, in such a way as to paralyse them without killing them, in order that they may furnish food for the wasp larvæ when they are hatched. The purpose of this operation is to prevent their escape, on the one hand, and, on the other, to prevent their putrescence, which would take place if they were killed. The Ammophila shows the knowledge of an experienced entomologist in selecting exactly the right spots to sting. How is it done? Bergson appears to think that this undoubtedly marvellous instinct is more marvellous than other products of evolution. I venture to think differently: it appears to us more marvellous than other developments, partly because it is less familiar, partly because it happens to have a resemblance to human activities. The natural selection which can account for an insect's leg can account as easily

for the most astonishing instinct. However, let that pass. Bergson proceeds to 'suppose a *sympathy* (in the etymological sense of the word) between the Ammophila and its victim, which teaches it from within, so to say, concerning the vulnerability of the caterpillar.'[1] Now this is one of those purely verbal explanations which explain nothing. For it is just as hard to explain how the *sympathy* got there, as how the instinct got there. By calling it a 'sympathy' a supernatural origin is dragged in: 'spirit' is a *deus ex machina* for metaphysics, but in science it only removes the difficulty a step farther off, and makes it the harder to grapple with. But even admitting the possibility of a sympathy, where is the evidence for it? As usual, the statement is founded upon the supposed inadequacy of other explanations. Bergson never will admit the possibility of ignorance. He will make any absurd suggestion rather than confess himself at a loss: and here we see a trait widely separating him from natural science. For instance, he affirms that 'it is better to go back to [the Aristotelian theory of nature] than to stop short before instinct as before an

[1] *Creative Evolution*, p. 183.

unfathomable mystery.'[1] This is indeed an amazing statement. The Aristotelian theory of nature is on all hands agreed to be untenable; it is better then to adopt an untenable theory than no theory at all! And this is the philosopher who accuses Huxley of abandoning experience for the requirements of a system! After this, any further instances would be an anti-climax, and we will leave *Creative Evolution* for good. We cannot help, however, making an observation on the last lines of the whole book, in which Bergson alleges that, in the latter half of the nineteenth century, a new Scholasticism has grown up round the Physics of Galileo, as the old Scholasticism grew up round Aristotle. This is nothing more or less than the well-known ruse of discrediting an opponent by comparing him to previously discredited individuals. For the comparison itself is utterly unfounded. Modern science and mediæval scholasticism are so remotely sundered in every conceivable respect, that in truth we should be lacking humour if we attempted to repudiate the comparison.

[1] *Creative Evolution*, p. 184.

Criticism upon *Matter and Memory* must follow a course very similar to that on *Creative Evolution*. It seems to me that a great part of this work is vitiated by the assumption made in the opening sentences of the book. 'We will assume for the moment that we know nothing of theories of matter and theories of spirit, nothing of the discussions as to the reality or ideality of the external world. Here I am in the presence of images, in the vaguest sense of the word; images perceived when my senses are opened to them, unperceived when they are closed.'[1] In the first sentence Bergson repudiates all theories; in the second sentence he espouses Idealism. It is perfectly certain that no one who knows nothing of theories, will accept straight away the belief that the external world is nothing more than a system of images. On the contrary, if we eschew theories, we must assume that the external world is just what it appears to be; not images, nor ideas, but solid reality. The assumption of its reality is at the basis of every step in the progress of science and increase of knowledge. No advance has ever been made

[1] *Matter and Memory*, p. 1.

by assuming that it is 'spirit' or mental image. I grant that Psycho-physics has to be approached either from the side of matter or from the side of spirit. Bergson approaches from the side of spirit: I cannot go with him: we will approach only from the side of matter, where at least we know from the progress of physical science, that we are on firm ground.[1] The attempt to get rid of theories only shows how impossible it is to start on these inquiries without making some sort of assumption; either the reality of matter, or the reality of spirit, with its images of matter. Metaphysics always assumes the latter, science assumes the former. From our naturalistic standpoint, it is difficult to assail in detail many of Bergson's doctrines in *Matter and Memory*. We can only say that they rest on false foundations; that if we begin with spirit as a foundation, we might just as well reach the

[1] This may possibly be denied, on the ground that physical science in recent years has suggested that matter may be completely resolved into an aggregate of centres of force. That, however, has no bearings on the present discussion. Force is just as objective as matter; and has always figured in materialist history. No one supposes that touch and vision can show us all the attributes of matter: and further analysis of atoms cannot reduce them to 'spirit.'

conclusions of Spinoza, or of Leibnitz, or of Fichte, or of Hegel, as of Bergson. Beginning with spirit, we have plenty of systems to choose from. Beginning with matter, we have but one; the collection of theories embraced under the heading of science. For no one has ever suggested that there can be more than one system of science, while there can be as many systems of metaphysics as there are metaphysicians to invent them.

Bergson's ingenious *a priori* refutation of psycho-physical parallelism fails on this ground. 'To make of the brain the condition on which the whole image [of the Universe] depends is in truth a contradiction in terms, since the brain is by hypothesis a part of this image.'[1] I can conceive no possible metaphysical answer to this criticism. But the objection cuts two ways. If we start with spirit, then parallelism is doomed. *If, on the other hand, we start with parallelism, then the idealist method is doomed.* Let us elucidate this statement more fully.

We will assume the reality and objectivity of matter. Parallelism affirms that sensations, feel-

[1] *Matter and Memory*, p. 4.

ings, and all psychical manifestations are passive accompaniments of nervous activity. Whenever a particular nervous tract functions in a particular way, a particular sensation arises. True, the outside observer never becomes aware of those sensations, the symptoms of which he sees in another; all he can become personally aware of are certain nervous changes proceeding in that other: which nervous changes, the subject only is aware of as sensations. Now there is no sort of contradiction here, as implied by Bergson. If we begin with matter, and not with spirit, parallelism becomes wholly intelligible. There is nothing contradictory in saying (to take Huxley's example) that if we prick a pin into somebody, that pin will set up certain nervous and physical changes which we are able to witness, and will also produce something altogether different, which the subject will call pain, but which cannot be directly revealed to any one else, and may have no objective reality. I challenge any one to affirm that that at least contains any contradiction. Now if we begin with the absolute existence of the pain caused by the image of the pin, as Bergson does, and work outwards from there,

we do at once get involved in contradictions. The point is abstruse: and I need only repeat that, from the materialist standpoint of science, the whole argument of Bergson becomes irrelevant: the soundness of his logic itself constitutes a condemnation of his premisses.

This fundamental error appears to vitiate most of the doctrines of *Matter and Memory*. Let us make further observations on various points of the book.

That perception does not reside in the brain of the perceiver, but in the object perceived, is a startling statement. For by hallucination, a perception may arise without any object at all. Moreover, the only sure way of destroying a perception is to destroy the brain which perceives it. If we clout the subject over the head, the object (for him) promptly vanishes. If we fill the subject with whisky the object appears in duplicate. These facts are circumvented by lengthy but unconvincing postulates of interaction between subject and object. Of all this argumentation, I have only to say that it has not a fact to support it. It is pure guesswork, in which the author proceeds as usual by wonderful analogies,

which are no sooner made than they are taken for truth. We are assured that it is not theoretically inconceivable that matter should be perceived without sense-organs.[1] To me it *is* altogether inconceivable: that is to say, I am wholly unable to conceive it. It is just as inconceivable as that gravitation should cease to act, and houses totter upwards into the sky. In a sense, that perhaps is not inconceivable: we can imagine the thing happening, but what should we think of an astronomy which based its principles on its not being theoretically inconceivable? Either the statement is pointless, or else it is made to assist a theory: the theory which needs such assistance need not detain us longer.

Further curiosities are that perception is a 'query' or 'demand'[2]: pain is an 'effort to repair damage.'[3] These things bear their absurdity on the face of them: they mean nothing at all. Pain may very possibly be accompanied by an effort to repair damage, or it may be analogised to such an effort; but to say that it *is* the effort becomes ridiculous as soon as we demand concrete significance to the words. We might

[1] *Matter and Memory*, p. 40. [2] *Ibid.*, p. 42. [3] *Ibid.*, p. 56.

as reasonably affirm that the smell of onions is the same thing as kicking footballs.

Just as perception is located in the perceived object, so Bergson alleges that pain is located in that part of the body where it appears to be felt. This is of course in opposition to the belief of physiologists, who affirm that the pain is really located in the brain, not at the nerve endings; and who support their contention by pointing, for instance, to the pain which a patient feels and refers to his foot after it has for years been amputated. I am not, however, concerned to defend a well-established fact: I wish only to point out Bergson's mode of refuting it. 'If [the pain] is not at the point where it appears to rise, neither can it be anywhere else: if it is not in the nerve, neither is it in the brain; for to explain its projection from the centre to the periphery a certain force is necessary, which must be attributed to a consciousness that is to some extent active. Therefore, he must go further. . . .'[1] Here we get a chain of deductions, every link of which appears to be false. Why should any force be necessary? Why should that force be attributed

[1] *Matter and Memory*, pp. 62, 63.

to a consciousness? Why should that consciousness be active? It was one of Huxley's chief gifts to biology to have largely banished deduction from that science, by strongly insisting on the danger of travelling outside ascertained facts. A succession of deductions like this, in a physiological inquiry, is *a priori* almost certain to be erroneous. To me *a posteriori* there seems not even *prima facie* evidence in favour of any of them: and they are set against a fact experimentally arrived at!

The doctrine of the two kinds of memory is a complication of natural facts that will not appeal to anybody. But the fundamental objection to it is that so often raised already: that there are no facts to support it. The Professor attacks the physiological view of memory: he adduces a number of facts, such as those of sensory aphasia, in opposition to it; and having destroyed it to his own satisfaction, forthwith we are presented with a new theory which is assumed to be true. This new theory is worked out in extreme detail; it is unaffected by sensory aphasia, but otherwise the only credentials it can produce are those of extreme unintelligibility.

We have already had occasion to observe that a doctrine is safest from criticism when it is most difficult to understand. The fog is so thick that the critic is disarmed. I therefore make no specific attack upon it, beyond insisting upon the complete absence of evidence. Moreover, the attack on the physiological theory could scarcely convince any one but a metaphysician. 'If memories are really deposited in the cortical cells, we should find in sensory aphasia the irreparable loss of certain determined words, the integral conservation of others.'[1] But it is not so. Now, what would a man of science consider himself entitled to deduce from this? Nothing further than that words are not represented in the brain in minute specific areas for each word, but that they are, or may be, represented in some other way, possibly still undiscovered. But what does Bergson infer? That the memories of words are not stored in the brain at all. He refutes a crude physiological hypothesis; he then *assumes* that the refutation applies to all possible physiological hypotheses, and thence jumps to his own theory. It would have been just as

[1] *Matter and Memory*, p. 149.

reasonable to found his own theory upon a refutation of Gall's phrenology. For phrenology was a thoroughly materialistic hypothesis; it assumed absolute connection between mind and brain, and definite localisation of mental faculties in the brain. Phrenology has long been exploded, but no one (except a metaphysician) infers from that that there is no connection between mind and brain. A belief in that connection is in no wise shaken by the exposure of phrenology; nor is it shaken by the criticism of other crude attempts to localise mental qualities. These criticisms are effective only for the particular theories against which they are levelled. Hence we see that Bergson's theory of mind and matter is founded upon the same fallacy as that of the vital impetus—the fallacy which we stigmatised as the mannikin fallacy at the beginning of the chapter. In bald outline it is like refuting Mahommedanism, and then arguing: (1) Mahommedanism is untrue; (2) therefore all religion is untrue; (3) therefore all morality is a superstition. We have only to point out that (2) does not follow from (1), nor does (3) follow from (2). In Bergson's works

the second step (2) is invariably taken silently immediately (1) has been established. The great show of facts in his works are all connected with step (1), the criticism of adverse theories. Step (2) is then slurred over without a word of discussion, and the rest of the philosophy is taken up with step (3), which is just a hypothesis or guess, or intuition, having no connection with foregoing facts, but set out with such a wealth of words and analogies that the unwary reader quickly loses his way and is totally lost. In alliance with the main paralogism is the copious misuse of analogies and of words, the latter especially in the form of materialising abstractions such as time, life, motion, memory. The mediæval realists could scarcely have gone farther.

The tendency to attribute substantial reality to abstractions is conspicuous not only in metaphysics, but in the thinking of all primitive races. Thus a Basuto will not walk by a river lest his shadow falling on the water should be seized and devoured by a crocodile. Nearly all children at one time or another attempt to evade their shadows by jumping or running. Names like-

wise are looked upon as material things: as among the Chinooks, one of whom thought that Kane's desire to know his name proceeded from a wish to steal it.[1] Here, as elsewhere, Bergson does nothing more than systematise and magnify, on an enormous scale, almost universal vices of thought.

I have finished. It remains only to meet some rejoinders of a general character, which may be made. I am likely, nay certain, to be told that I have misunderstood Bergson's theory. Well, I shall ask in reply, what is meant by misunderstanding? Is it not attaching to the words of an author a meaning he did not intend? Now, it has been my contention all along that Bergson's words are counters, devoid of meaning.

Nevertheless, I have proceeded in my argument as though they had a meaning. I shall therefore almost necessarily be accused of misunderstanding. I can only answer that I am not disposed to limit a controversy to simple bandying of words. I assign to my adversary's words those meanings that they bear in ordinary

[1] Spencer's *Principles of Sociology*.

parlance; I assume them to be true money, and it is not my fault if they land us in ridiculous conclusions. The only other method open would have been to meet his words with other words equally meaningless: and embark upon a windy warfare that never could be brought to the touchstone of reality. I repudiate that method.

If Bergson's philosophy can only be understood, in its author's sense, by deliberately avoiding the attempt to pass behind his words to the things they stand for: then I can only describe his system as a monument of misdirected and useless ingenuity. I appeal to the public not to be misled by the brilliance of his analogies, the pyramids of words upon words. Truth does not need to be decked out with gaudy raiment. A showy exterior is no index to the soul within. Knowledge can be attained only by painfully crawling along the dull material path of facts, not by the ambitious soaring of speculative intuition.

CHAPTER IV

THE PROGRESS OF PHILOSOPHY[1]

'Stern necessity, to others dim
With night and terror, has no fears for him.'
SCHILLER.

F. SCHLEGEL said that every man is born either a Platonist or an Aristotelian. And we do in fact find throughout philosophy two deeply opposed tendencies, which are as well indicated by Schlegel's terms as by any other. The one is subjective in method, the other objective; the one derives knowledge from inward intuition, the other solely from outward experience: the one starts from spirit, the other from matter: the one culminates in metaphysics, the other in science. At the dawn of philosophy, the differentiation between the two methods was incomplete. Greek

[1] For the facts comprised in this chapter I have drawn largely on Lewes's *History of Philosophy* and Lange's *History of Materialism*. Part of the chapter has been already published in the *Edinburgh Review*, and I am indebted to the editor and publishers for kind permission to reprint it.

hylozoism represents a fusion of the tendencies, rendering their separate outlines barely discernible. In modern times the antagonism has become excessively acute. On the one hand, we have the 'absolute idealism' of Hegel, and the whole school of German metaphysics; on the other hand, we have the thorough materialism which underlies modern science—a materialism which may indeed be repudiated as a philosophy by men of science themselves, but which nevertheless lies at the basis of all their efforts. So great is this gulf between science and metaphysics at the present day, that, in fact, it is only with difficulty that the logical weapons of the one can be brought into action against the other. I propose to run rapidly over the history of philosophy, with the view of illustrating the antinomy stated by Schlegel. On the one hand, we shall find the Platonisers: the philosophers who derive from the depths of their own souls all their knowledge about the Universe. Of these, I shall boldly affirm my belief that they have never contributed, *qua philosophers*, one particle of useful or reliable knowledge to the acquirements of humanity, nor one solitary principle that is destined to hold its

own against the advancing enlightenment. But only *qua* philosophers be it noted. The metaphysicians, however mistaken their systems, have often been men of great intellectual power and consummate ingenuity. It is natural that they should frequently let drop in the course of their works some idea of great suggestiveness, or some fact of special interest. Plato's philosophy may not be worth a farthing, but many of Plato's *obiter dicta* are full of value, and make his works perennially interesting to read. So that, although we may condemn their metaphysics root and branch, we are far from denying value to their writings as able and cultivated men.

On the other hand, we shall find the Aristotelians of philosophy. And here it may be remarked that few even of the Aristotelians have been free from the Platonising method. Aristotle himself was sodden with it: the method pursued in his metaphysics is altogether opposed to that suggested in his scientific works. Nevertheless, the evil element of Platonism is modified by the appearance of a real positive method; and among many philosophers, both of the ancient and modern world, the positive method actually

obscures the metaphysical. From the Aristotelian tendency, we shall isolate two elements of value. In the first place, we shall find real and important additions to knowledge. In the second place, we shall find the dissipation of superstitions. The first sphere has now been appropriated by science: all positive results of value in the history of philosophy belong more properly to science than to philosophy. The second sphere has not been appropriated by any special set of people. At the commencement of civilisation men's beliefs formed a hotch-potch of truth and falsity in hopeless confusion. Undisciplined ignorance is not characterised by a negation or paucity of beliefs; on the contrary, it revels luxuriously in pseudo-explanations; it leaves nothing unexplained in its narrow conception of the Universe. To abandon anything as inexplicable, or to confess ignorance, is only reached after long discipline and by highly cultivated intelligence. Hence one of the most important tasks of philosophy has been the dissipation of error. Accompanying the ever-widening sphere of true knowledge, there has gone an ever-narrowing

sphere of false knowledge. The discovery of *real* explanations has proceeded *pari passu* by a delimitation of the class of questions which are capable of being explained. We shall look, therefore, only for two elements of value in philosophy: the one creating knowledge, which is not philosophy at all, but science taught by men called philosophers; the other destroying pseudo-knowledge.

In the earliest efforts of Greek philosophy, we see nothing but an attempt to 'explain' the Universe by naming as its cause any idea that happened to be handy. Thales regarded water as the origin of all things: Anaximenes deposed water in favour of air. Diogenes of Apollonia followed Anaximenes, but identified air with soul (ψυχή) or intelligence, thus sowing the germs of a more spiritualistic theory. These early philosophers, bracketed together as the Ionian school, were content with taking these concrete objects and calling them the origin of the Universe. The Ionian school was succeeded by the mathematical school, in which ideas somewhat more abstract begin to appear. Anaximander of Miletus hit upon infinity as the origin of all

things: for, he asked, how can any single finite thing be the origin of *all* things? Pythagoras went farther, and looked upon number in the abstract as being the goal of their search: he erected into special favour the primary number one. And here let us pause to warn the reader, lest he should think Greek philosophy somewhat abstruse, not to seek too closely into the meaning of these grotesque speculations. People are apt to miss the point of primitive speculation by supposing it to have a meaning much deeper than appears on the surface; and they are apt also to deliver themselves of profound interpretations which would have greatly startled the founders of the theory, and been far beyond their comprehension. The Pythagorean apotheosis of number has in it nothing more abstruse than the Ionic apotheoses of air and water; save only that number being abstract, the theory is not quite such an obvious contradiction of sense-impressions. It is an example of the way in which, as the previously-assigned causes are seen to be more and more untenable, they are gradually made more misty and abstract; and by ever-increasing unintelligibility endeavour to keep

without the growing sphere of intelligence. In precisely the same way Bergson assigns 'time' as the origin of life and consciousness: time being a still more abstract conception than number. In this particular respect Bergson stands in much the same relation to Pythagoras as Pythagoras to Thales. Increased vagueness, subtlety, and incomprehensibility are combined in a consummate effort to remove the theory from the shafts of intellectual analysis.

A further advance was made by the Eleatic school, which combined the more reasonable elements in the Ionian and mathematical. Xenophanes, inheriting the doctrine of the One from Pythagoras, amplified it, as Aristotle tells us: 'Casting his eyes upwards at the immensity of heaven, he declared that the One is God.' He thus founded philosophic monotheism or pantheism. Parmenides followed in the footsteps of Xenophanes, though he was perturbed by the question whether there could exist such a thing as non-existence: a pretty question for metaphysicians, reminding us of Bergson's analysis of the idea of nothing. Zeno of Elea further elaborated the doctrine of the One: he was a

zealous disciple of Parmenides, and devoted himself mainly to spreading the views of the latter. At this time cosmological speculation was getting rather into difficulties. Zeno was propounding the famous paradox of Achilles and the tortoise; and he was likewise proving for the benefit of his contemporaries that motion was impossible. For those who disliked metaphysical subtleties, it must have been a relief to turn to Heraklitus's new gospel that fire was the origin of all things.

Here, however, we enter upon a new epoch in Greek philosophy. For a century and a half speculation had been rife as to the origin of the Universe, and it was felt that the explanation was not much nearer than before. The attention of philosophers was therefore naturally directed to problems of the limitation of knowledge, and whether the explanation sought for was, after all, one that could be brought within the confines of human understanding. Ontological inquiry gave place to epistemological inquiry. But before following it into this new phase, let us note what character the ontological theories have in common. It is clear that all these philosophers

were animated by one common emotion or sentiment—the strong desire to ascertain the ultimate cause. In Chapter VI. I shall exhibit more fully the affiliation of belief upon sentiment. I must here anticipate the conclusion of that chapter by remarking that wherever sentiment is strong, critical judgment is weak: sentiment by itself is sufficient to maintain belief in anything that gratifies it, so long as the most *outré* opposition to experience is avoided. So we see that some of these philosophers invoked water, some air, some infinity, some number, some fire, as the goal of their desire. In short, the prevalent desire seized upon any handy object and erected it forthwith into the desiderated eminence. It would be chasing a will-o'-the-wisp to seek how they came by these particular concepts. The adequate explanation is afforded by the desire for a first cause appropriating to itself whatever it required for its own gratification. To the logical inquirer their beliefs are unintelligible: to the psychological inquirer, they bear their explanation on the surface.

Hastening on now to our next epoch, we find philosophers dilating upon the uncertainty of

knowledge derived from the senses. This doubtless represents a true intellectual advance —the gradually strengthening discrimination between the objective and the subjective. It made possible great progress in the efforts to interpret natural phenomena; but it lent itself unfortunately to the wildest speculation, on the principle that the obvious contradiction afforded by the senses was no true criterion. Of Heraklitus, we need say but little. His sobriquet of 'the obscure' shows plainly enough that he availed himself of the privilege still extensively utilised by metaphysicians—to shroud absurd hypotheses beneath inscrutable obscurity of language. He taught, among other things, that individual things *are* strictly not at all, but *become.* He resembled Bergson in fact, in the ridiculous and supernatural importance which he attached to flux, or change, for its own sake. Anaxagoras was a far more interesting thinker. He denied (before Demokritus) that there was any such thing as chance, thus curiously anticipating modern science: but he was not afraid of paradox. His attempt to prove that snow was black shows that at all events he was no bigoted believer in sense-

impressions, and dimly reminds us of the grotesque proposition which Hegel laid down for the delectation of his disciples past and present —*Sein und Nichtsein ist dasselbe.*

Empedokles greatly improved the cosmology of the Ionian school by affirming that, instead of one primary element, there were four—earth, air, fire and water. Whether this achievement induced in him the complaint known to moderns by the irreverent title of 'swelled head,' I cannot say; but he proclaimed himself a god, and appears to have been treated as such by his adherents.

Demokritus was an immense advance upon his predecessors. We should perhaps be justified in regarding him as the greatest of Greek philosophers prior to Aristotle, and in many ways far more profound even than the great Stagirite Demokritus specifically affirmed that 'nothing happens by chance, but everything through a cause and of necessity.' That is to say, he affirmed the universality of law: and he is repeatedly attacked by Aristotle for his abandonment of teleology. Though, naturally, his views are crude if compared with modern knowledge,

yet for his own times they were marvellously advanced. His anticipation of modern science was not merely general in character, but special; for his propositions concerning motion are decidedly suggestive of Newton. He deduced the Universe from atoms in motion; affirming that all else was 'only opinion.' Of course, however, he could not entirely escape the error of passing beyond the teachings of experience. He was the founder of materialism, saying that 'the soul consists of fine, smooth, round atoms, like those of fire.' In Demokritus, with all his errors, we recognise the first great apostle of positive methods. The Aristotelian element in him far outweighs the Platonic. He recognised even that misuse of words is at the bottom of metaphysical errors. 'He who is fond of contradiction and makes many words is incapable of learning anything that is right.' Demokritus has been handed down to posterity as the 'laughing philosopher' in contrast with his contemporary Heraklitus, the obscure, who was known as the 'weeping philosopher.' May we not see even in this slight indication, the contrast between a true and a false philosophy of life?

We come now to Protagoras and the Sophists. The rise of the Sophists marks a period when general discontent with the methods and conclusions of philosophy was rife. Disgusted with the failure of all attempts at the acquisition of positive knowledge, they took refuge in a scepticism that was scarcely less injurious to the ultimate discovery of truth. For their scepticism did not take the form of a wholesome distrust of untried hypotheses: it led them to doubt the very existence of truth itself. Thus they used to boast that they could 'make the worse appear the better cause.' They recognised neither absolute right nor absolute truth, and fell back upon expediency as the proper test of action and belief. Protagoras affirmed that man was the measure of all things, and emphatically insisted on the relativity of knowledge. In many ways the Sophists resemble the Pragmatists of the present day. In each case the new scepticism originates as a protest against the failure of pre-existing philosophy: in each case the possibility of absolute truth is denied: in each case the opinion of mankind is taken as the criterion of relative truth and the proper guide to action.

But whatever there may be of truth in this way of looking at things, it is of no greater value to the philosopher than it would be to the statesman to know the number of inches between London and Berlin. Scepticism is heuristically barren: to erect it into a philosophic dogma is to confound the means with the end: the preliminary attitude of doubt with the final attitude of knowledge assured. Such an assertion as that made by the Sophists, that contradictory propositions are equally true, is sufficient to condemn them in itself. I deny that a thing can both be true and not true. There is either a planet of our solar system more distant than Neptune, or there is no such planet. I do not know which of these statements is true: but I am perfectly certain that they are not both true. If I am asked to justify this conviction, I decline to do so. If I am confronted with a flawless metaphysics to prove I am wrong, I remain unmoved. If we are going to admit *that* absurdity, there is no reason why we should stop anywhere. The certainty of the conclusion is not affected by our capacity to analyse the method by which it is reached: for it will always

remain inherently more probable that an error has arisen in an abstruse analysis, than in a plain dictum of experience. All who reason thus are destined before long to be swept away before a more intelligible system.

This at all events was the fate which befell the Sophists in the progressive Greek communities of the fifth century B.C. In the height of their wealth and power, there arose from among the poorer classes a mind of Gargantuan force, which with no sort of fuss or display proceeded to knock them down like ninepins one after the other. The rise of Sokrates marks an epoch in the intellectual history of the world. He brings us out once more from the misty obscurity that had again overtaken philosophy into a land of plain and comprehensible propositions—propositions indeed with which I cordially disagree, propositions which the Athenians looked upon as immoral, but which have an honest and unmistakable meaning, with no cloudy diction to envelop their weaknesses. His title to fame rests not upon his constructive philosophy, but upon his giving definiteness to thought, his mortal hatred of obscurity, his determination that

any one who held a belief should be compelled to recognise all the implications of his belief. He came as an innovator in method. Against the rhetoric of the Sophists he brought with deadly effect the weapon of dialectics. Professing himself to know nothing, he would approach one of the Sophist teachers and commence to cross-examine him, as though for his own information. With relentless certainty, the adversary was driven by corollaries from his own theories into some self-contradictory or absurd position, where Sokrates would leave him in impotent fury. Opposition to the leading men of his day brought with it the inevitable unpopularity and accusations: he died as philosophic martyrs always have, with less trepidation than was felt by his judges.

Sokrates' philosophy was altogether retrogressive, when it abandoned the destructive attitude. He believed that knowledge was identical with virtue: that morality was the only science: that every other study was futile and absurd. In short, he was the originator of that hopeless confusion between science and ethics, which has never since ceased to vitiate the conclusions of philo-

sophers. A strong prepossession as to what *ought* to be—that is to say, of what we should *like* to believe—is perhaps the most dangerous of all sentiments in those who set out to ascertain what *is*. Nature does not conform to our ideas of morality: were the notion of morality applicable to nature at all, we should have to stigmatise many of its workings as foully immoral and infinitely wicked. But of this more in a future chapter. Sokrates again set up the banner of teleology, which Demokritus had assailed. In short, Sokrates in his positive beliefs started a reaction whose influence is still unexpired.

Sokrates having turned the thoughts of men to morals, we find all sorts of extreme views of morality carried out into practice. On the one hand, there was the gay Aristippus: a confirmed materialist, a philosopher of far greater insight than Sokrates: rightly anticipating the great discovery of Epikurus that life is for happiness, but wrongly applying that doctrine into a justification for sensuality and the grosser pleasures. Against Aristippus might justly be advanced all those gibes which ignorant moralists are accustomed ineptly to fling at Epikurus. On the

other hand, there were the Cynics, Antisthenes and Diogenes, whose savage ill-temper gave origin to an equally savage philosophy in which the Sokratic search for virtue took on the most austere and forbidding character. Antisthenes 'The dog,' and Diogenes with his tub, are the classical examples of men whose naturally unamiable feelings find expression in vehement moral indignation against humanity, and in vain and ostentatious assumptions of superior goodness. The habits of Diogenes also illustrate the close conjunction that often subsists between asceticism and sensuality.

A new epoch in philosophy now opens with the famous name of Plato. I have already adopted him as the type of all that is bad in metaphysics: I have now only to express that opinion in more emphatic form. True, he relieved philosophy from the shackles set upon it by Sokrates: he did not pretend that virtue was synonymous with truth: but he did what was every whit as foolish, in assuming that outward facts must harmonise with his own notions of what was beautiful or poetical or religious. Grote has remarked that his theories are altogether *a priori*: 'They

enunciate preconceptions or hypotheses which derive their hold upon his belief not from any aptitude for solving the objections he has raised; but from deep and solemn sentiment of some kind or other—religious, ethical, æsthetical, poetical, etc., the worship of numerical symmetry or exactness, etc.' In short, he decided what was true by appealing to his own sense of what was beautiful or good, and therefore ought to be true; and he proceeded then to apply his hypothesis to the facts, which had to be twisted about until they fitted the preconceptions. He deified the subjective method; can we wonder at the many absurdities into which he fell, as, for instance, proving that the world is an animal? And he adopted the subjective method in full consciousness of its meaning, affirming and believing that this was the real way to arrive at truth.

Aristotle, on the other hand, I have taken as the example of the righteous tendency in Philosophy. I have done so because he insisted on the empirical method: the necessity of proceeding to the unknown through generalisations from the known, and not, like Plato, *vice versâ*. But, as Lewes observes, there was really so very little

'known' to generalise from, that he was precluded from carrying out his own method. His four first principles included that of the *final cause*, viz. that there is a benevolent purpose running through every event in the universe, that nothing happens without an ultimate aim. Not only did he abandon experience in his metaphysics; but in a variety of small details, as Eucken has pointed out, he made remarks that observation would at once have overthrown. Such are that women do not have palpitation of the heart, that they have fewer teeth than men, that men have eight ribs, that eggs float in strong brine, that cows do not cough, and many others.

Lange points out that throughout philosophic history, belief in materialism has waxed and waned periodically. The materialism of Demokritus was replaced by the spiritualism of Sokrates, Plato, and Aristotle: and it was not till a century or more had elapsed that materialism once more came to the fore. The interval was filled by Pyrrho and his followers, who carried their scepticism so far as not only to assert nothing, but to refuse even to assert that they asserted nothing. We are not therefore obliged to consider their

additions to positive knowledge, but proceed at once to Epikurus, who reached perhaps the highest philosophic position of all the ancients. Until quite recent times, it has always been the case that thinkers in advance of their age have been misunderstood, and falsely charged with the various deductions, which sciolists at large have drawn from their pronouncements. Few philosophers have suffered as much from this cause as Epikurus. The doctrine that human happiness and welfare is the end of morality lends itself with singular facility to misapprehension by that large class of people whose notion of happiness is limited to sordid pleasures and gross sensuality. The misapprehension has survived even to our own day in the opprobrious connotations which we attach to the English words derived from the name of Epikurus. Yet it was very differently that the great philosopher interpreted his own doctrines. That happiness is the object of life is a self-evident proposition: it is followed by every one, including those who would most strenuously deny it. The only question is how that happiness shall be attained: and to this question Epikurus gave the answer that it

was to be attained by equable and calm living, by a virtuous life, by temperance, by pleasures of the soul rather than of the body: and not, as among common men, by pursuit of immediate gratification. Epikurus was the founder of hedonism, and regarded philosophy as the art of living, rather than the art of truth. In the latter art he was a sceptic, though he taught that everything was governed by eternal law and order. He defended the latter proposition on ethical grounds. Saying that fear and superstition were important causes of unhappiness, he showed that they would be banished by a belief in the universal mechanism of Nature. If everything was explained or explainable by natural laws of cause and effect, a great part of the anxieties of mankind would be removed. Thus the greatest moralist of antiquity gave his adhesion to materialism.

Epikurus was the last of the great Greek philosophers. And what is the net result of philosophy up to that time? In ethics, the principle of happiness. In science, the principle of universal law—a principle, however, which cannot be regarded in that age as more than mere speculation. The facts at their disposal

were scarcely sufficient to found a theory deserving the name of scientific. But beyond this, philosophy had achieved nothing whatever, except in the removal of superstitions. Instead of accepting as true anything that we find in our minds, Aristotle had set forth the principle that experience with facts must be our main guide to truth. But in the sphere of positive construction, philosophy had failed absolutely and completely. Much rubbish had been cleared away: the ground had been prepared for science, but science had not yet been reached. The Greek civilisation was merely a preface to the intellectual progress of mankind. Without that clearance of the way, science could never have developed; so heavy were the obstacles to be removed, so gigantic the task, that the greatest race of antiquity exhausted their powers in the effort, and expired before its accomplishment.

The ground did not for long lie fallow. Even among the Greeks, there were certain beginnings of true science: Aristotle's *De partibus animalium*, for instance, is a work showing remarkable powers of observation, and exemplifying true methods of research. But it was in

Alexandria that the scientific methods took most root. Philology was represented by Aristarchus of Samothrace; history by Polybius; geometry by Euclid; mechanics by Archimedes; astronomy by Hipparchus; anatomy by Herophilus and Erasistratus. Experiment was first employed in Alexandria: there, too, induction took its origin. These wonderful achievements were rendered possible only by the preceding clearance of Greek philosophy. But they rest upon the conclusions of Demokritus and the principle of the universality of mechanical law: for there can be no induction without the assumption that the laws of nature are necessary and unchangeable. They rest, too, upon Aristotle, who announced that the way to obtain knowledge of nature was to look at nature and see, instead of looking into one's own soul, as had previously been done, and was systematised by Plato. And even Plato, though he piled many obstacles in the road, taught men the use of deduction. It was only through such preliminary work that Aristarchus of Samos could foreshadow the theory of Copernicus, that Ptolemy could be of use to Christopher Columbus, that

Galen could lay the foundations of medicine. The theory of the independence of mind and body was first shaken when Galen cured nervous complaints by physical methods.

While science went forward, philosophy languished. The Stoicism of Zeno and his followers was the philosophy most in harmony with the austerity of Roman manners; it unconditionally posited virtue as the object of existence—virtue of so harsh a character as soon to produce the natural reaction. In the poem of Lucretius, *De rerum Naturae*, we find, perhaps, the highest as well as the latest effort of ancient philosophy. Not only did Lucretius accept the universality of law, but he even included the phenomena of life as explicable on purely natural and physical principles. Lucretius did much to spread the doctrines of the Epikureans among the Romans. But when the moral degeneration of Rome took place, Epikureanism was less useful than Stoicism in the attempt to stem the tide, and both finally were overwhelmed.

In Alexandria, Plotinus announced that the 'One' was the origin of all things. Proclus identified science with theology. The old rule

of metaphysics is still maintained: to save itself from the dissolving contact of positive knowledge, by making its 'causes' and 'explanations' ever more abstract and intangible. Mysticism and ecstasy reigned supreme: while men of science were laying the foundations of a materialistic physiology, philosophers were preaching the complete dissociation of soul from body. The intellectual degradation of the Middle Ages is foreshadowed by the unnatural mysticism of Plotinus, who blushed to think he had a body. Finally reason gave way to faith, and philosophy flickered out altogether. For more than a thousand years religion took the place of science and philosophy, and enthralled the intellect of men. The blackest barbarism and superstition had to be passed through, before humanity once again stirred uneasily beneath the heavy chains which bound them; this time to reach an enlightenment far transcending the wildest dreams of the ancients.

The predominant philosophy of the Middle Ages was Scholasticism. Aristotle was taken as the fountain of all wisdom: and the questions discussed were largely as to the interpretations

to be placed upon his writings. Not only were their speculations feeble, but the subjects which they selected to speculate about were no less so. What can be more futile or uninteresting than the great dispute between nominalism and realism? Are general terms actual objective things, or are they merely names to signify a group? When we speak of a *genus* or a *species*, do we mean anything beyond the individuals comprised under the heading? In these days, few could ask such questions, and scarcely any one could hesitate about the answer. But even here, we can see an intimate relationship to Bergson's metaphysics. These mediæval realists did not confound words with things more egregiously than our French philosopher. If they thought that a genus was a real, positive, existing thing, independent altogether of the individuals composing it, the error is scarcely more absurd than the attribution of substantiality to life, time, and motion. Materialising abstractions is a vice of thought, not at all confined to the scholastics; probably no system has so industriously employed this method of procedure as the philosophy of Bergson.

The Arabic writers filled an important task in assisting to carry on the dim light of ancient learning; but with them, too, there was scarcely energy for more than a slavish adherence to Aristotle. Abubacer, for instance, attacked Ptolemy's views of celestial motions, not on the ground of observation, but because they could not be harmonised with the theories of Aristotle. Alpetragius, indeed, ventured upon a new hypothesis of his own; but he was careful to repudiate the allegation that he had been led to it by observation: it had been disclosed to him, he said, by inspiration! Thus even among the Arabians do we find a conscious employment of the method of intuition, now vigorously defended by Bergson. So low had fallen original thought, that for centuries Isidore of Seville's *Encyclopedia* was accepted as a text-book, in which were contained such absurdities as the derivation of *homo* from 'quia ex *humo* factus est.'

During these long centuries of darkness, materialism seems to have disappeared altogether. It has, indeed, been alleged by their enemies that the murderous sect of the Assassins espoused a materialistic philosophy. There is

little evidence in favour of the statement; but, as Lange remarks, if it were true, 'the Assassins would be the solitary example of a combination of materialistic philosophy with cruelty, lust of power, and systematic crime.' It would indeed be surprising if mediæval materialists had altogether escaped the abominations so systematically practised by the Church. A more authentic case is that of Nicolaus de Autricuria, who in 1348 was compelled to recant materialistic doctrines at Paris. Evidently he was a man of the highest ability, who would have shone like a first-magnitude star in a more happy environment: for even in those dark ages, he taught that the road to knowledge was not through Aristotle or Averroes, but through personal examination of things themselves.

It was not till the renaissance that materialism once more came to the fore. Distrust of authority, together with positive materialism, were the two most conspicuous characteristics of the Revival of Learning. In science, they were exemplified by Galileo and Kepler; in philosophy, by Francis Bacon and Descartes. Great were the obstacles with which they had to

contend. When Galileo discovered the satellites of Jupiter, Cremonini would never again look through a telescope; for Aristotle would have been falsified, had he seen them. While Galileo was teaching geometry for a pittance, Cremonini was expounding Aristotle for a huge salary. But it was in England, the classic land of materialism, that the first sign of light appeared. Roger Bacon launched the first thunderbolt against the blind adherence to authority. William of Occam gave the deathblow to Scholasticism. Bacon remained an obscure Franciscan friar, deprived of money, persecuted and imprisoned for disobedience to his superiors, forbidden to publish the works, for which he had prepared by many years of excessive study and the attainment of marvellous erudition. Meanwhile Albertus Magnus the 'Ape of Aristotle' was fêted by the dignitaries of Church and State; showing his hatred of materialism by his protest against the introduction of mathematics into physics.

Copernicus, indeed, had been allowed to develop his new astronomy without molestation; partly no doubt because he died at the publica-

tion of his book; partly because his theory of the Universe was so revolutionary, and so scientifically stated, that its contradiction of Aristotle and the Church was not immediately realised. Not so Giordano Bruno, who made it his business to spread the doctrines of Copernicus. Long imprisonment and a martyr's death were the rewards of this powerful friend of human enlightenment. Bruno, to whom the Revival of Learning owes perhaps more than to any one else, was specially influenced by Lucretius and Epikurus. His materialism, his hatred of authority, are everywhere apparent; and he died while firmly establishing astronomy on the materialistic principles, which have ever since been recognised.

Just as we find spiritualism growing luxuriously with Plotinus at the decadence of ancient philosophy, so we find it still paramount at the break-up of the Middle Ages. In antiquity, even Galen had assumed 'animal spirits,' an idea which was seized upon as thoroughly harmonious with Scholasticism; and Paracelsus had developed it into an extravagant philosophy which saw spirits and demons at work in every event

that happened. All these spirits were swept away before Harvey's great discovery of the circulation of the blood. The introduction of materialist principles into physiology was one of the most serious blows that spiritualism suffered.

In philosophy, the materialist awakening was no less conspicuous than in science. With Bacon and Descartes, philosophy advanced for the first time to a point higher than had ever been achieved in antiquity. By philosophy, I here mean of course the destruction of superstitions which has to precede and accompany the increase of positive knowledge. Bacon placed the inductive method upon a rational basis; Descartes performed the same task for the deductive method. That Bacon gave anything more than a very imperfect view of induction cannot of course be gainsaid; nor can it be denied that his scientific judgment was singularly unfortunate, and his own deliverance from spiritualist absurdities very incomplete. Nevertheless he concentrated attention on the necessity of observation and experiment as the means of acquiring knowledge. To us, in these days, that

means appears so obvious that it is easy to underestimate the difficulty of the discovery; an occasional Bergson is required to remind us of the omnipotence of 'intuition' in the pre-Baconian era. Bacon's list of fallacies might still be studied with advantage by metaphysicians; especially the *Idola Fori*, or those fallacies which arise from allowing words to govern thoughts, instead of thoughts governing words.

Descartes' system was less materialistic than Bacon's; indeed, it is looked upon as the spiritual father of the succeeding idealistic systems. Nevertheless he carried the mechanical theory of the Universe to more bold applications than had ever before been attempted. The foundation of his system is a true metaphysicality; *Cogito, ergo sum.* It seems difficult to understand, how Descartes can have imagined that his existence was in any way rendered more certain, by being deduced from the fact of his thinking. The deduction of one obvious fact, from another equally obvious, appears to be a mere waste of words, though posterity have regarded it as a saying of deep profundity. Thus, though Descartes only partially derived his system from

study of the Universe, he appeared to have had a natural bent towards mechanical explanations of phenomena which led him to many results, incorrect indeed, but adumbrating in a remarkable way the future discoveries of science. Such, for instance, was the theory of vortices, by which he endeavoured to explain the workings of the world purely from matter and motion. The theory failed; but the attempt at a mechanical explanation gave the path, along which subsequent discoveries have travelled. Had there been a Bergson in those days, his opportunity would have been unrivalled. He would have splendidly demolished the theory of vortices, then pointed triumphantly to the failure of mechanical explanations, and to the resulting metaphysical system which he would have reared out of nothing to satisfy all inquirers.

Yet the metaphysics of those days are dead: the possibility of mechanical explanations is more alive than at any previous period in the history of philosophy. Three centuries after the death of Descartes, a philosopher arose in England, whose system and mode of thought closely resembled those of the illustrious Frenchman.

Herbert Spencer, like Descartes, had strong mathematical and deductive tendencies: like Descartes, he was animated strongly with the principles of mechanism, and established a philosophy based solely upon matter and motion. But like Descartes once more, his method was deductive, or synthetic as he called it: it arose from happy subjective intuitions rather than from a deep knowledge of objective facts. And for that reason, Spencer's philosophy was destined to fail, just in the same way as Descartes'; but the failure of neither one nor the other is in the least prejudicial to mechanical explanations at large.

It was in the region of physiology that Descartes pushed mechanism to its most extreme development; and it is just in this very region that modern science, in the person of Huxley, has pronounced him to be a physiologist of the highest calibre. He affirmed that animals were mere machines, or automata, actuated solely by physical and chemical forces, and devoid of any subjective correlate. It can never be formally proved that he was wrong. That animals possess a consciousness is a thing which we can

never become directly aware of. We only know that *we* are conscious, and the so-called law of continuity forcibly suggests that animals are too. But that law of continuity is not a certainty: it can carry us, at the best, only to a very high degree of probability. It is not, however, in the denial of consciousness to animals that Descartes demands our admiration: it is in the conception of them as highly complex machines or automata—a conception which in all probability is absolutely correct; though, far from being limited to the lower animals, it must be extended to include also the human species. Thus, while mechanistic materialism was on all sides driving out spiritualism from the arena of explanations, with Descartes the tendency was carried so far as to stop only one point short of the final stronghold of spiritualistic metaphysics.

From Bacon and Descartes sprang the two divergent lines of philosophy, which, roughly speaking, culminate respectively in science and metaphysics. On the scientific side, Gassendi and Hobbes were the earliest products. Gassendi revived the materialistic system of Epikurus: he attacked the Cartesian meta-

physics, and contributed powerfully to the advance of the empirical methods of science. While admitting the existence of 'spirit,' he assigned to it no rôle whatever in his system, but regarded the soul as composed of material atoms.

Hobbes strongly impressed on English philosophy that materialistic leaning which it has never since altogether lost. He advocated the doctrines of Copernicus; and referred to earlier astronomy as having been strangled by philosophers with the snares of words. Unlike the metaphysicians, Hobbes writes with perfect lucidity and freedom from obscurity. He knew, too, why obscurity is a vice of all metaphysics. 'Words,' he said, 'are wise men's counters; they do but reckon by them; but they are the money of fools.' He affirmed that man, alone among living creatures, was capable of absurdity; and that those most subject to it were philosophers. On prejudices he was equally severe:—'When men have once acquiesced in untrue opinions, and registered them as authenticated records in their minds, it is no less impossible to speak intelligibly to such men than to write legibly on

a paper already scribbled over.' Few men have done so much as Hobbes in the performance of the chief function of philosophy, the clearance of the superstitions and mental rubbish that litter the path of progress. He illustrates, further, the immense contrast between the materialism of the Renaissance and the spiritualism of the Middle Ages.

Locke carried out on the psychical side the doctrine which Bacon had put forward on the physical side. Locke is chiefly known to fame as protagonist of the view that experience is the sole origin of knowledge: he attacked the theory of innate ideas. Bacon had affirmed that the means to knowledge were observation and experiment. The truth which Bacon introduced into logic was the same as that which Locke introduced into psychology. Though Locke's work was of great value, it is necessarily very imperfect when viewed from a modern standpoint. Like all the psychologists of early times, he appeared to look upon an idea or conception as a *thing* in the brain. The question whether it was there originally, or acquired during life, was therefore intelligible. But when we come

to look upon ideas as *processes* rather than things, the question itself loses much of its meaning. The nature of a mental 'idea' is given, in one sense, wholly by the cerebral conformation. In that sense, therefore, innate ideas are true. They would now be called instinct. The physiological way of looking at things brings to view the irrelevance of the ancient questions, as much as the erroneousness of their answers. But however imperfect Locke's theory may have been, it has in practice been wholly beneficial. The old notion was that, if it was required to obtain knowledge of some objective fact, a suitable method was to burrow into one's mind with the hope of finding there the desiderated information. Locke denied the validity of that method: he affirmed that, if the burrowing led to any information whatever, there was no ground for supposing that the information was true. Only that information could be relied upon which was derived from objective experience. Here Locke's influence was admirable and unalloyed: he might with great advantage have given lessons to Bergson. He had an incurable suspicion of all 'great volumes swollen with ambiguous words.'

How can we help thinking of Bergson when we read Locke's attack on Scholasticism. 'Vague and insignificant forms of speech and abuse of language have for so long passed for mysteries of science; and hard and misapplied words, with little or no meaning, have, by prescription, such a right to be mistaken for deep learning and height of speculation, that it will not be easy to persuade either those who speak or those who hear them that they are but the covers of ignorance and hindrance of true knowledge. To break in upon this sanctuary of vanity and ignorance will be, I suppose, some service to the human understanding.' No more need be said to show Locke's position as one of the great rubbish-clearers, nor that a chief ingredient in the rubbish removed was *words*.

The age of Charles II., although the most immoral, was perhaps the most progressive in English history. The monarch, who is responsible for the first appearance of females on the stage (then a centre of immorality), was the same monarch who founded the Royal Society and made science a popular pursuit among the higher classes. The dissipation of ignorance was bear-

ing fruit in a rapid extension of experimental inquiry. Newton, Boyle, and Huyghens all expressly adopted a mechanical view of the Universe. Huyghens declared that all natural effects must be explained 'per rationes mechanicas.' Boyle and Newton derived much from Epikurus and Gassendi. Boyle even affirmed that the human body was a 'curious and elaborate machine': a considerable advance upon Descartes. He attacked the truly Bergsonian theory of that day, to the effect that the deleterious results of swallowing pounded glass were due to a 'facultas deleteria.' Later, John Toland energetically upheld the mechanical view of life: he took the example of a dog pursuing a hare, 'the bulk of the external object acting by its whole force of impulse or attaction on the nerves, which are so disposed with the muscles, joints, and other parts as to produce various motions in the animal machine.'

But the highest flight of mechanistic materialism was reached by the French philosophers of the eighteenth century. The galaxy of brilliant writers who flourished in the latter half of that century appear to have received their stimulus

largely from the *Dictionnaire Historique et Critique* of Pierre Bayle.

The most interesting individuals of the period, from our standpoint, were De Lamettrie and D'Holbach. By the former, the mechanical theory was pushed to its extreme conclusion. With the latter, crude materialism reached its ultimate development. Lamettrie was a materialist who stoutly defended the scientific methods of experiment and observation. He proved by innumerable instances the close connection between mind and body: and the bold title of his chief work *L'Homme Machine* indicates sufficiently the trend of his speculation. In those days, the connection between mental and bodily manifestations was a comparatively new doctrine. It was opposed by the metaphysicians with the same animosity that they now oppose the notion of the connection being complete and absolute. The spiritualism which in those days could venture to deny all connection, can in these days do no more than look hopefully to those obscurer parts of the mind, where the proof of connection is the most difficult to set forth. Lamettrie also seems to have been the first to perceive that

we can never be absolutely *certain* of the existence of any other consciousness but our own. He attacked the theory, then prevalent, that religious ideas were a universal instinct, by the instance of the deaf-mute of Chartres, who, when he suddenly recovered his speech and hearing, was found to be destitute of any religious sentiment. Finally he ventured to publish a defence of atheism, not as emanating from himself, but as the type of argument which an 'abominable' man had employed to him!

D'Holbach's *Système de la Nature* has acquired the reputation of being the 'Bible' of materialism. D'Holbach himself is famous as the centre of the little group of atheists who were then intent upon the propaganda of rationalism. Diderot and D'Alembert were urging their views through the Encyclopedia; Voltaire introduced Newton's philosophy into France. As a philosopher he was less extreme than many of his contemporaries, and decidedly opposed to atheism; yet the immense extent of his influence dealt a blow to French orthodoxy from which it never afterwards recovered. He was a determinist, and inclined to materialism, though little

disposed to any dogmatic 'isms.' Doubtless his philosophic leanings were strongly emphasised by residence in our own country of progressive opinions. With the help of Locke, he saw through the free-will paradox; both he and Robinet pointed out that the problem was not whether we can *do* what we want to do, but whether we can *will* what we want to will.

Since the French illumination the defence of materialism has passed from the sphere of philosophy to that of science. In Germany indeed, in the middle of last century, there was an outbreak of philosophic materialism with Feuerbach, Vogt, Moleschott, and Büchner. But these, or the latter of them, founded their doctrines professedly on natural science. They were guilty of not a few crudities, such as that the brain secretes thought as the liver secretes bile and the kidneys urine. If these statements had been made by the earlier materialists, we should have passed them over as natural outcomes of the vagueness of philosophic analogies. But they cannot be so easily pardoned when they profess to aim at scientific accuracy. Büchner, whose *Kraft und Stoff*, despite its imperfections,

is a brilliantly-written polemic, resembles nearly all the materialists in his hatred of obscurity. He affirmed that philosophy should be intelligible to every educated man, that any philosophy not so intelligible was not worth the ink it was printed with; that clear conceptions fall into lucid language.

The founder of scientific materialism was Cabanis, the distinguished physiologist. By him the dependence of mental function upon nervous organisation was established as the basis of psychology. Since his time the most famous protagonists have been Huxley and Du Bois-Reymond. The great discoveries of last century told heavily in favour of materialism. In physics, the correlation of Physical Forces gave a great impetus to the idea of universal mechanism. In biology, natural selection was established as a materialist and physical explanation in a region which hitherto had been abandoned to all the dogmas of metaphysics. Science is completely, and without exception, materialistic. The progress of science therefore necessarily means the progress of materialism. The larger the sphere of natural facts that can be

reclaimed for science, the smaller the sphere which remains for spiritualism. Auguste Comte in France, and Herbert Spencer in England, have both founded philosophies on a materialistic basis. In recent years, it is true, there has been some talk of a reaction: it is alleged that science justifies a belief in 'spirit,' nay, even that science compels such a belief. We should not take this claim too seriously. Materialism, as Lange has so well proved, has never had a steady progress: periods of advance have invariably alternated with periods of delay. Last century the great discoveries suggested materialism so forcibly as to produce a great wave, certain to be succeeded by a trough. This century, the discoveries have not been such as to force materialism so prominently forward: on the contrary, the possible resolution of matter into force is an abstruse conception, whose obscurity is favourable to the demons of metaphysics. Nevertheless the fact still remains, that no single scientific step has been made that assigns any active rôle to 'spirit.' That spiritualism should be defended in the name of science means nothing: for men always endeavour to strengthen their views by referring

them to an authoritative source. Even the great Diderot, in his immaturity, argued that materialism and atheism were condemned by modern science. Yet how great has been the advance of both, in company with the later developments of science! Some very ignorant people (especially metaphysicians) have even thought that materialism was dead. As though a doctrine, originating among the Greeks, and for the last three hundred years gradually advancing, were likely to die in a decade! The only period in which materialism vanished was in the barbarism of the Middle Ages. One might almost say that the progressiveness and intellectual civilisation of any community in history could be accurately gauged by the extent of its adherence to materialistic views.

The line of descent that we have followed from the period of Bacon and Descartes terminates in science and materialism. We now have to follow the other line which terminates in metaphysics and idealism. I have already observed that we must begin by assuming the reality either of matter or mind. The scientific series has tended strongly to assume the reality

of matter. The more enlightened among them, indeed, have assumed the reality of mind with equal readiness; but they have not invoked it for assistance in the interpretation of natural phenomena. Very different has been the aim of the metaphysicians. They have always assumed the reality of mind, and very generally the non-reality of matter. Their explanations are expressed in terms of mind, not in terms of matter. How far they have got we shall now be able to observe. We first come upon Spinoza. There is nothing particular to say about him, save that he evolved his system from the depths of his own mind, explaining the Universe as manifestations of an infinite impersonal substance. His system has just as strong a claim on our belief as that of Bergson or any other metaphysician. That Spinoza was a brilliant genius, demanding high admiration both morally and intellectually, is no sort of guarantee for a system which is not based on objective facts. That he should have held many views greatly in advance of his time, only brings into greater prominence the fact that no genius, however exalted, can dispense with a literal adherence to the order of external facts.

Spinoza's system is in many ways superior to Bergson's. He was a firm believer in the universality of causation : his exposure in his *Ethics* of the origin of the fallacies of teleology, makes that work still worthy of general study. That he unfortunately did not confine himself to the evidence of ascertained facts, is the more pardonable that in those days the range of positive knowledge was still closely cramped.

Leibnitz was a later development of the metaphysical school. With him the errors of subjectivism were beginning to move towards that ultimate contempt of facts which has brought metaphysics into such deserved disrepute. He hopelessly confused truth with morals. He affirmed that whatever existed was for the best : that everything was due to a final cause : that perfection and harmony were universal. He alleged a 'pre-established harmony' between the inner and the outer worlds. He was the great rival of Sir Isaac Newton, and was looked upon by the spiritual-minded as their last resource and protection from the abominable materialism of Newtonian physics. Leibnitz furnishes an instance of the unreliability of the purely mathe-

matical type of mind when thrown among real facts: the deductive method, suitable to mathematics, where the *data* are few and simple, is altogether misleading when applied in cases where the data are too numerous or complex to be accurately defined. Leibnitz was a great mathematician: for although his discovery of the Differential Calculus was probably pirated from Newton, yet he invented the notation which has survived to the present day. At inventing harmonious systems, he was much more happily occupied than in moving among facts, multitudinous and inharmonious.

The next great thinker on metaphysical lines was Berkeley, the founder of idealism. He pointed out that it is only through consciousness that we become cognisant of the Universe. Our consciousness is immaterial, psychical, subjective and therefore must be totally different from outward facts, material, physical, and objective. We *know* of nothing except our consciousness: the whole Universe is expressed in terms of our consciousness: we have no experience of anything else. Therefore, said Berkeley, only consciousness exists, and the rest is but a mode

of its working. He assigned a spiritual cause of the Universe, in place of a material existence.

Now the popular attempts to refute Berkeley are one and all founded upon a misunderstanding of his doctrine. Dr. Johnson thought that he disproved Berkeley by kicking a stone. But Berkeley never denied that there exists something called a stone which gives rise to all the sensations that we understand by that name. All he denied was, that there was anything else in addition to these sensations. And in so far as he keeps to this attitude, he is wholly irrefutable. We have in fact no knowledge of a stone beyond the sensations which it gives us : and by keeping wholly within our experience we are not entitled to say that anything exists beyond these sensations. Anything further is an inference, which cannot be rigidly proved. Berkeley therefore furnished an adequate refutation of positive materialism. Berkeley himself, however, in the assumption of a spiritual first cause, went beyond experience ; and idealism is best considered in connection with the more perfect formulation of Hume.

Hume pointed out that Berkeley's refutation

of the reality of matter was equally applicable to the reality of mind. We have no more experience of a spiritual substratum of the Universe than of a material substratum. All we can immediately speak to from experience is a succession of impressions and ideas. The sensations produced on us by external facts are 'impressions.' The recollections of these, and the thoughts of the mind, are 'ideas,' somewhat fainter than impressions. Our Universe consists wholly of impressions and ideas. Spirit, matter, everything else are but inferences, of which there can be no certainty. Hence Hume landed in complete scepticism, the only possible conclusion for metaphysics.

Once that conclusion has been reached, there is nothing further to be said or done. The conclusion itself is a blind alley: it is heuristically barren, and leads no further. So clearly did Hume recognise this fact that he thereupon abandoned philosophy, and, like Voltaire, took to writing history as a more useful and practical occupation. Scepticism, while it undermines the theory that materialism and realism are *absolutely* true, nevertheless leaves them both established

more securely than ever as *working hypotheses.* Matter may be ultimately, as Mill said, nothing but a permanent possibility of sensation : it may be only 'impression' : physicists in recent years similarly suggest that it may be only 'force'; but whatever it may be ultimately resolved into, *for us it remains matter* undergoing changes that are generalised in the laws of physics and chemistry. That we cannot reach an ultimate explanation is little astonishing : for on every side we are surrounded, not merely with inexplicables, but inconceivables. Consider, for instance, the boundaries of space. We cannot conceive infinite space : suppose we were to travel beyond the most remote of the visible stars, can it be that we are no nearer a boundary than when we started? We travel a myriad miles into space, and then another myriad, and so on to myriads of such myriads, and myriads of these again without being able to conceive a limit to space any more easily. And the same with time. We cannot conceive that the matter composing our earth has existed for ever without commencement, and will continue for ever without termination : that the atoms of our bodies will

hereafter come to be separated by infinite stretches of space, yet will survive eternally into the future as they have descended eternally out of the past. Yet we are equally little able to conceive any alternative. Since therefore we find ourselves suspended in isolation, surrounded on all sides by infinite inconceivabilities, why are we to be surprised that the ultimate nature of matter is also incomprehensible? The scepticism of idealism is merely another such incomprehensibility; it leads no further than does the scepticism forced upon us by space and time. As far as we are concerned, matter is matter, force is force: the materialism of science is a sound hypothesis, and no other hypothesis has yet been shown to be sound. The spiritualists think that things are cleared up by dragging in 'spirit'; Bergson clears things up with 'time.' When some of them have been able to discover a verifiable fact with their organon we may begin to believe them: but at present no weapon of discovery has ever proved its value, save those that are based upon the objective reality of matter and force, without any question of 'spirit,' 'real time,' or any of the other metaphysical

ghosts and hobgoblins. Indeed, the invocation of these aids appears to show nothing more than a lamentable inappreciation of the magnitude of the problems they are supposed to solve.

With Hume, metaphysics dwindled to a mathematical point and vanished into scepticism. After Hume there need never have been any further discussion of metaphysics, nor any further attention paid to it. Fichte, Schelling, and Hegel made great reputations. We can only regard them as having piled new obstacles in the path of true knowledge. Their systems are fully as rarified and unintelligible as that of Bergson. Fichte, like Bergson, appears to have believed in a vital impetus. I gather, at least, that his *Anstoss* must be the same kind of thing as an *élan vitale*. From what has been said in the previous chapter, it will be manifest that this explanation of life is purely verbal, making the difficulty no clearer than before.

As for Hegel, his object appeared to be to carry metaphysics to its own destruction. Any one who founds his system on the proposition that everything is the contrary of that which it is, may arrive at any conclusion he likes. In-

deed, I should accept most of Hegel's conclusions more readily than his premisses. He was a violent opponent of Newtonian science: Newton himself he called a barbarian in thought; and he despised the empirical school as 'trivial.' His contempt for experience, and hatred of science, did not prevent him from wandering into that despised region. He argued on *a priori* grounds that there could not be more than six planets. It is true that there are now known to be at least eight major planets, and over six hundred minor planets: but that of course is a mere vulgar fact, and quite indifferent to the philosopher who affirms that existence is the same as non-existence.

Between Hegel and Bergson sundry analogies may be pointed out. Hegel says that 'Philosophy dwells in the region of self-produced ideas, without reference to actuality.' Bergson similarly affirms that 'we must break with scientific habits which are adapted to the fundamental requirements of thought, we must do violence to the mind, go counter to the natural bent of the intellect. But that is just the function of philosophy.'[1]

[1] *Creative Evolution*, p. 31.

Hegel would doubtless have subscribed to Bergson's dictum that philosophy 'is not constrained to scientific precision':[1] a maxim of which both philosophers make liberal use in their works. Hegel, like Bergson, affirmed that creation is ever in progress, instead of having been a single act as in the old theology. He does not appear to have identified creation with time, but to an outside observer the two views are very similar. A final analogy is in the incomprehensibility of the two thinkers: for Hegel is one of the obscurest of philosophers. It is not merely chance that the philosophers whom men are most ready to follow are those whom they find the greatest difficulty in understanding. Let us not forget the profound saying of Boileau, 'Ce que l'on conçoit bien s'énonce clairement.'

Even Kant, the greatest of all metaphysicians, cannot be excluded from our condemnation of metaphysics. If the metaphysical method were capable of ever adding a single particle to our real knowledge, it would assuredly have been compelled to do so by the powerful intellect of

[1] *Creative Evolution*, p. 89.

Kant. Yet Kant failed just as completely as his predecessors and successors have failed. He assumed a world of noumena of which we can know absolutely nothing, except in the appearances which they present to us, and called by him phenomena. The relativity of all possible knowledge was stoutly defended by him. Herbert Spencer, in spite of his boast that he had never read Kant, formulated a not dissimilar theory. Both assumed that things in their reality were totally different from what they appeared to us to be. Both regarded the objective world as merely appearances, implying some deep underlying substratum which Kant called '*Dinge an sich*' and Spencer called 'The Unknowable.' We cannot but regard both these theories as rank metaphysics. What title have we to assume that there is a reality underlying our visible and tangible Universe? Only this, that 'we cannot help thinking so'—a precious expression, which has been utilised to defend every metaphysical doctrine ever invented. Supposing I affirm, in contradiction to metaphysics, that there is no ultimate reality underlying the Universe, nor any explanation of

the Universe, even to infinite intelligence: how could I be refuted? how even could my theory be shown to be less plausible than the opposite theory? If I maintain that the Universe has no explanation anywhere existing, and no possibility of any explanation, I merely add one more incomprehensibility to those which, as already shown, meet us in every direction when we try to pass beyond matter and energy. And this particular incomprehensibility is no worse than those of Kant and Spencer. For, if *Dinge an sich* and the Unknowable can explain the Knowable, what shall explain the *Dinge an sich*? The moment we travel beyond our working hypothesis of materialism, we are irretrievably lost in a maze of inconceivabilities. The attempt to explain, even in the vaguest of fashions, merely displays inadequate appreciation of the problem presented.

At length we reach the end of this cursory survey of the history of philosophy, and are brought back to the conclusion outlined in chapter one. We may take our choice between scepticism and materialism. But scepticism is purely negative: having reached it we get no

farther. Hence we are forced back upon a sort of materialism which we must recognise, not as true, but as a sound working hypothesis: true, that is, in the same sense that Dalton's atomic theory is true. The whole of science is built upon materialism, as the whole of chemistry is built on the atomic theory, and the foundation is secure: upon scepticism nothing can be built. Let me reply to a few likely criticisms.

'What!' say the thoughtless, 'do you attribute the whole Universe to mere chance, to the blind and meaningless working of unchangeable mechanical laws?' And why not? If you see anything more incredible in that than in any other of the ultimate realities which face us, you have grotesquely missed the utterly inconceivable mysteriousness of the Universe. If we start with space filled by evolving nebula, it was as likely to develop into this particular universe as any other. The odds at the time were infinity to one against any named development. I will answer the difficulty by proposing another problem of the same character. Here it is:—*Given* the infinity of space, *Required* to prove that Bergson does not exist. If Bergson exists,

he must exist somewhere: is it suggested that he exists in Paris? That is impossible, for Paris is a finite area in infinite space: therefore the odds against Bergson existing in Paris are infinity to one. That is to say, it is a mathematical certainty that Bergson does not exist in Paris. Equally it might be shown that he does not exist in any other locality. Therefore he does not exist anywhere. This conclusion, which can be deduced with apparent inevitableness from the infinity of space, is further fortified by deduction from infinity of time. Bergson cannot exist: because the present is a finite period in the midst of infinity: hence it is infinity to one against his present existence: therefore he does not exist.

Now I state these paradoxes for the purpose of pointing out that the fallacy, upon which they are based, is precisely the same fallacy fallen into by those who exclaim against the chance evolution of the Universe. They say they cannot conceive chance working this effect: in other words, it is infinity to one against this effect having been produced by chance. But we live in a Universe where infinity to one chances are

momentarily taking place. Like most of the objections to mechanical materialism, the error lies in failing to perceive the hopeless multitude of inconceivabilities by which we are unceasingly assailed. People will only appreciate wonders with which they are unfamiliar. Those that are familiar have ceased to strike attention. And hence by referring unfamiliar events to familiar causes, a difficulty is felt by those who have lost their marvellings over things they often see. In suggesting that events hitherto unexplained are of the nature of mechanical events, they think there is some derogation of dignity, some diminution of the marvellousness of the un familiar.

Philosophy fails, then, in its search for final truth. Realism and materialism being the assumptions which underlie every step of intellectual progress, we must be content with them, not as finally true, but as satisfying and necessary working hypotheses, beyond which we can go no further. I repudiate all attempts to explain the Universe. I repeat, as in chapter one, that the feeling we have of a necessity for such an explanation arises from the

conformation of our brains: which think by associating disjoined ideas. When the whole of our ideas and experiences constitute one term, there is no other term available for association. In other words, there is no further knowledge possible. Hence we must reconcile ourselves, as best we can, to the ultimate fact, that while condemned ever to feel the need for a last explanation, no last explanation is possible or perhaps even exists. The 'disharmonies' of Metchnikoff here find their extremest instance. The problem of metaphysics is a shadowy spectre which must for ever continue to haunt the mind of man. If he stretches out his hand to seize it, he meets nothing substantial, and only falls painfully to the ground: for the spectre is a malign but inexpugnable figment of his own imagination.

CHAPTER V

THE AUTOMATON THEORY

Est-ce là ce rayon de l'essence suprême,
Que l'on nous peint si lumineux ?
Est-ce là cet esprit survivant à nous-même ?
Il naît avec nos sens, croît, s'affaiblit comme eux.
Hélas ! il périra de même.

VOLTAIRE.

IN the previous chapter, I have traced the gradual progress of the mechanistic theory of the Universe in the sphere of philosophy. I had at first intended to write a similar chapter tracing the theory through the history of science, but the task appears to be unnecessary. For while in philosophy, there have been elements and tendencies of all kinds, in science there has only been one tendency—that towards materialism. The history of scientific discoveries is a history of materialistic successes: for no scientific discovery has ever been made that is not based upon materialism and mechanism. There can be no mistaking the trend of science, and there

appears to be no object in reciting here the facts which can be read in any history. The same remarks apply to the progress of medicine.

Now, if mechanism is universal in the inorganic world, is it not equally universal in the organic? The answer of Huxley and of many men of science is in the affirmative. I propose to describe the theory of life which ensues from the hypothesis that matter and energy are the sole realities. I propose to describe it only, not to prove it: that belongs to the work of physiologists. The only argument which I wish to employ here in its favour is that supplied by the law of continuity from history. Originally everything was explained by spiritual agency: gradually mechanical explanations drove out the spiritual. Nearly always the mechanical explanations met with great opposition; but invariably they triumphed. At present their supremacy is admitted almost everywhere, but there is one small corner of the field where spiritual 'explanations' still linger. The law of continuity from past history suggests that that corner will before long be reclaimed like the rest. But it does not prove it, any more than the same law proves

that lower animals have consciousness. In both cases, it is nothing more than a probability. I attempt no proof of the automaton theory: I confine myself to a description.

The universe is conceived as consisting of a fixed quantity of matter, susceptible neither of creation nor destruction, and capable only of changing from one form into another. When a candle is burnt, a destruction of matter appears to take place. But it is experimentally proved that the sum-total of the weights of the carbon dioxide and other gases given off in the process of combustion is exactly equal to the weight of that portion of candle which has disappeared, together with the oxygen consumed. And these gases may, by other natural or artificial processes, give rise again to a solid body of the same weight as themselves. Solid may change to liquid, and liquid to gas; but the total quantity of matter in our universe remains unaltered.

Parallel and complementary to the theory of the 'Indestructibility of Matter' is the theory of the 'Conservation of Energy.' It is by means of energy that our senses are affected by matter. Matter may be in a state of rest or motion, it

may emit heat or light or sound, it may be in any electrical or magnetic condition. And it has been proved that, just as the total quantity of matter remains unaltered through all transformations, so the total quantity of energy likewise remains unaltered. If a hot body becomes cold its heat-energy appears to have been lost. But it has been experimentally proved that the surrounding bodies, such as the air or other fluids or solids, have gained by conduction, convexion, or radiation, a quantity of heat exactly equivalent to that which has been lost by the cooling body. In the same way, a body in motion in space continues in motion (Newton's first law) for ever in the same direction and at the same velocity unless diverted by some other body. If it should collide with another body, thereby impressing upon it some of its own motion, the energy of motion gained by the second body is exactly equal to the energy of motion lost by the first, assuming none to be spent as heat, or in other modes of energy.

Energy, though unalterable in quantity, is easily changed from one form into another. If a piece of lead is dropped on the floor its motion

is immediately destroyed. But at the precise instant in which the motion is annihilated, there appears energy, in other forms, which is shown to be exactly equivalent to the energy of motion lost. A certain amount of heat is generated, sound is given forth, there may be an emission of light, etc. etc. It is known exactly how much motion is equivalent to how much light, to how much heat, etc. etc. In short, energy, like matter, changes with the greatest facility from one of its forms into another, but the sum-total of all the energy in our universe remains unaltered: there is neither any creation nor destruction.

Viewed, therefore, in its widest aspect, the universe consists of a fixed quantity of matter together with a fixed quantity of energy, each of which is undergoing more or less continuous transformation from one of its forms into another. Events are simply, as Herbert Spencer put it, a 'redistribution of matter and motion.' The laws which govern these transformations are the laws of physics. They are secondary to the two primary laws; but resemble them in being *absolute*: no exception to them has ever been

discovered; and prophecies of future events founded upon them are invariably justified with complete precision. If the distribution of matter and energy at any given period is precisely defined, it is theoretically possible to deduce its distribution at any named future period, or to infer back to its distribution at any period now past. Theoretically possible only, because mathematics—our instrument of calculation—is sufficiently advanced to enable us to solve such problems only when the conditions to be considered are extremely simple; and, as a rule, in Nature, they are far from simple. Nevertheless, it is no longer a question of doubt that if certain quantities of matter, in certain forms, in certain relative positions, moving in certain directions, are endowed with certain amounts and forms of energy, the matter and the energy will undergo transformations and redistributions in a perfectly definite and theoretically prophesiable manner.

I have mentioned hitherto only a few of the forms of kinetic energy. But potential energy assumes forms that are equally interchangeable with the forms of kinetic energy. If a ball is thrown into the air, its upward velocity gradually

diminishes, until it momentarily comes to a standstill, before commencing its descent. The gradual loss of motion in its upward flight appears to indicate a destruction of energy. The gradual increase of motion in falling appears to indicate a creation of energy. But the fact is interpreted by assuming a potential energy 'of position'; so that for each unit of kinetic energy lost in the ascent, there is a unit of potential energy gained by the more elevated *position* of the ball: in such wise that its capacity for doing mechanical *work* remains unaltered. Similarly in the descent, the potential energy given by an elevated position is lost exactly *pari passu* with the gain of kinetic energy or motion.

A form of potential energy which will interest us far more is that known as chemical affinity. It is found that energy impressed upon a body may be locked away in its molecules and not be re-transformed for indefinite ages.

It is possible that this energy may exist in the form of a rapid vibration or some other condition of the atoms within the molecule: with that we are not here concerned: it is sufficient for us that the molecules of a body contain

vast stores of potential energy, and that the break-up of these molecules may be attended with a large visible liberation of energy, in the form of heat, motion, or otherwise. Take, for instance, the molecules of gunpowder. They contain within them vast quantities of potential energy that has been bestowed upon them in course of manufacture. The spark breaks up the molecules of gunpowder, and the contained energy is transformed partly into heat, but mainly into motion, causing the material particles to assume the gaseous form and fly apart with great velocity.

Again, the value of coal is due to the presence of energy in its molecules. By burning coal, or oxidising it, we break up its molecules, and their energy takes the kinetic form of light and heat.

Now, the progress of mankind in modern times has depended very largely on what we call machines. Since all that men can do to their surroundings is to change matter and energy from less serviceable to more serviceable forms, it is clear that it is of very great human advantage to arrange matter into the form of a machine which performs with regularity some

transformation whose necessity is constantly recurring. Accordingly we may define a machine as an instrument which has two ends: into one end energy of a certain kind is placed: out from the other end comes forth that same energy transformed into the shape in which we require it. In the process some of the matter and energy are lost by friction, etc.; the higher the efficiency of the machine, the less is the waste attending the transformation. Thus into one end of a steam-engine we place coal, that is, a large store of chemical energy: out from the other end we get motion; a shaft is turned, or a locomotive started. And the coal from which this energy has been extracted is transformed into worthless ash. Take again the machinery for supplying a town with electric light. The energy employed is the chemical energy in coal: by burning, it is changed to heat: the heat is changed to motion of a wheel: the motion is transformed into electrical energy: in that form it travels along wires to the houses, where it is once more transformed into light. Just as the object of a water-pipe is to ensure that water entering at one end shall move to a given spot at the other end, instead of

spreading hither and thither, so the object of a machine is to ensure that energy entering at one end shall come out in another desired form at the other end, instead of being dissipated all over the place in haphazard forms. The machine is an instrument for securing that a transformation of energy from one specific form to another specific form shall take place with regularity.

Mankind makes machines: does Nature also make machines? Is the redistribution of matter and energy in Nature entirely unsystematic, or are there centres, here and there, where energy is continually being transformed in some specific direction?

> 'And if what says thy Physics well thou scan,
> Ere many pages have been turned 'twill show
> That art of yours, as far as e'er it can,
> Doth follow God's, as scholars do the sage;
> So as God's grandchild seems the art of man.'[1]

So far from machines having been discovered by man, Nature is full of them. But since human-made machines are one and all subordinated to human purposes, while Nature-made machines have no such function, we are at first little disposed to recognise them as machines. We think

[1] Dante, *Inferno.*

of a machine, with regard to the purpose it fulfils, not with regard to the abstract nature of its working. Nevertheless we shall find evidence that human-made machines are but the imitation of Nature's machines, a poor imitation, it is true—dull, stupid, unadaptable instruments, far inferior to Nature's model, yet humbly utilising the same root-principle that Nature has adopted. I refer, of course, to living organisms, both of the animal and the plant kingdoms.

Let us consider the physiology of the garden cabbage. It is essentially a machine for converting light into chemical energy: for changing simple inorganic substances into the complex organic substance of the plant. The raw materials, nitrogen, hydrogen, oxygen, phosphorus, sulphur, iron, magnesium, calcium, potassium and others are held in dilute solution in the soil which surrounds and bathes the roots of the cabbage. By the purely physical processes of osmotic pressure and capillary attraction, they are sucked in through the root-hairs, and carried upwards through the xylem of the vascular bundles until they reach the leaves. Here they are brought

in contact with carbon dioxide absorbed by the leaves directly from the air. In the absence of light, nothing further happens. A cabbage is not a perpetual motion machine, and cannot elaborate complex molecules containing stores of energy, until that energy has first been brought in from outside. The carbon dioxide, together with the mineral salts absorbed through the roots, constitute, in the presence of chlorophyll, the raw material fitted to imbibe and hold fast the energy of light. The effect of sunlight is to cause a synthesis of these inorganic substances to form the highly complex substance called protoplasm, oxygen being given off in the process. The molecule of protoplasm is a very large, complex, unstable unit, containing a great quantity of latent energy, obtained by transformation of the sunlight. We see, therefore, that the fundamental life activity of a cabbage is exactly that of an artificial machine. Matter is transformed from one shape into another : energy undergoes a corresponding process. Coal is the petrified remains of wood, which, ages ago, bore leaves and entrapped sunlight. That sunlight lies stored up as potential energy in the molecules

of coal; and when by burning it, or adding oxygen to it, we cause a break-up of the molecules, the long-stored energy is surrendered once more in the form of heat and light. . . .

Now from the plant-world, let us transfer our gaze to the animal world. Let us plunge at once right into the centre of the controversy, and consider the animal whose habits and natural history are best known to us—Man. I speak for the moment without prejudice as to soul, mind, or any psychical activity. These phenomena, which we know only in ourselves, are altogether *sui generis*: I shall consider their character directly: they do not enter into the working of the machine as such. . . .

Man may be defined as a machine for converting chemical energy into motion. Doubtless other forms of energy, such as heat, escape from him, as well as motion. Though large in quantity, they are, however, quite subsidiary in considering his reaction on the universe. A petrol engine similarly is a machine for converting chemical energy into motion: yet here, the efficiency is rarely as high as thirty per cent., while in a steam engine it is very

much lower. But with all his infinite complexity and variety of possible movements, the physiologist finds in man the same basic principle as in a motor machine. I have already described how the cabbage contains within its substance large stores of imprisoned energy. Man eats the cabbage; and thus with his food accumulates a store of energy, which—as in the case of the coal—is liable to be liberated, as soon as the complex molecules which contain it are broken up. And the break-up is achieved in precisely the same way as in the case of coal, namely by oxidation. The burning coal draws oxygen from the air which, coming into contact with the carbon atoms of the coal molecule, promptly combines with them to form carbon dioxide: the withdrawal of the carbon element causing a collapse of the organic molecule. Man likewise draws oxygen from the air by the function of respiration: the oxygen passes through the slender membranes of the lungs into the blood-vessels, by which it is carried to every part of the body, causing everywhere oxidation or combustion, with evolution of energy. Withdraw the presence of air from a coal-fire, and it immediately goes

out. Withdraw the presence of air from Man and he promptly dies.

The chemical energy thus released is partly converted into motion. The entire sum of man's operations upon Nature is comprised in moving the relative positions of things. Nature does all the work: man can do no more than arrange objects in such positions that natural laws will change them automatically in the direction he desires. 'He moves a seed into the ground; and the natural forces of vegetation produce in succession a root, a stem, leaves, flowers, and fruit. He moves an axe through a tree, and it falls by the natural force of gravitation; he moves a saw through it in a particular manner, and the physical properties by which a softer substance gives way before a harder, make it separate into planks, which he arranges in certain positions, with nails driven through them, or adhesive matter between them, and produces a table, or a house. He moves a spark to fuel, and it ignites, and by the force generated in combustion it cooks the food, melts or softens the iron, converts into beer or sugar the malt or cane-juice, which he has previously moved to the spot. He has no other

means of acting on matter than by moving it.'[1] The manner in which motion is achieved is also invariable: it is purely due to the change of shape of the tissue called muscle, by which in contraction it becomes shorter and thicker, or in expansion longer and thinner. If we raise our forearm, it is because the biceps muscle connecting the scapula with the radius bone contracts and thickens. The scapula being fixed, the radius, and with it the whole forearm, is necessarily drawn upwards by the contraction. Man contains within his body a definite number of muscles. His sole power of affecting his environment consists in his capacity to contract these muscles in definite succession or simultaneously. He is like a toy or puppet, in which the arms, legs, and movable parts, are drawn upwards and downwards by wires. Only it is a mechanical toy, in which the wires work of their own accord for a short time after they have been wound up, or heated, or supplied with chemical energy, such as food.

I have hitherto travelled along non-contentious ground. The facts above described are admitted

[1] Mill's *Political Economy*.

by every one who has taken the trouble to study the matter.

A short while back, I referred to the psychical manifestations of Man, and then omitted them from the discussion. That omission must now be rectified. We have now to take note of the fact that, in addition to the two fundamental elements of matter and energy, whose various manifestations constitute the whole of our material Universe, there is a third element differing from the other two at least as much as they differ from one another. This third is variously named Mind, Soul, Psychic activity, Consciousness, according to the theory which we hold about it. It differs from matter and energy primarily in its complete incapacity for ever being made known to our outward senses. We have never seen it, or heard it, or smelt it : we are aware of it within ourselves only, and can never become directly aware of it in any other person or any external organism. It is by this circumstance in fundamental opposition to the material phenomena we have hitherto considered. The difference between subject and object is the widest difference that falls within the experience of humanity.

Numerous and remarkable theories have at different times been put forward as to the site of the soul. Modern science has disposed of the question, and we now know—not indeed its site, for that which is not material cannot have a site—but the conditions under which it becomes manifest. It is held that every psychical manifestation is accompanied by some physical and material manifestation in some portion of the brain. The precise nature of these physical manifestations is not yet known in detail. But the essence of the automaton theory is that all the actions of men are explicable as purely material and mechanical sequences, without invoking the assistance of mind or consciousness, or anything but matter and energy working under their ordinary laws. Consciousness appears only as an inert accompaniment of material cerebral changes. This is the theory to which Huxley gave the name of epiphenomenalism.

It is attacked mainly on the grounds of introspection. If I desire to raise my arm, I can do so. The desire is a fact of consciousness: and the movement is a fact of matter. It seems therefore that consciousness has broken into the

course of physical and chemical sequences. But it is not really so. For the desire exists not only as consciousness, but as a particular state of the brain; and the precedent to the motion of the arm is not the mental desire, but the cerebral substratum underlying the state of consciousness called desire. Until educated, we are quite unaware that any cerebral condition does underlie consciousness. We therefore inevitably assume that consciousness does what in reality is only done by its physical concomitant. An illustration will elucidate the difficulty.

Suppose there existed a Tantalus who was condemned for evermore to strike with a hammer upon an anvil. Suppose that Tantalus, his hammer, and his anvil were concealed from the observer's view by a screen or otherwise, and that a light, carefully arranged, threw the shadow of the hammer and anvil upon a wall where it could easily be seen. Suppose an observer, whose mind was *tabula rasa* were set to watch the shadow. Every time the shadow of the hammer descended upon the shadow of the anvil, the sound of the percussion is heard. The sound is only heard when the

two shadows meet. The hammer's shadow occasionally beats fast, occasionally slow : the succession of sounds exactly corresponds. Perhaps the hammer raps out a tune on the anvil ; every note heard follows upon a blow visible in the shadows. The two series correspond invariably and absolutely ; what is the inevitable effect upon the observer's mind ? He knows nothing of the true cause of sound behind the screen : his whole experience is an experience of shadows and sounds. He cannot escape the conclusion that the cause of each sound is the blow which the shadow of the hammer strikes upon the shadow of the anvil.

The observer is in the position of an introspective philosopher. Introspection teaches us nothing about nerve-currents or cerebral activity : it speaks in terms of mind and sensation alone. To the introspective philosopher, it is plain that some mental or psychical process is the condition of action. He thinks, he feels, he wills, and then he acts. Therefore the thinking and feeling and willing are the cause of the acting. Introspection *can* get no farther. But now the physiologist intervenes. He skilfully dissects away the

screen, and behold! there is a real hammer and a real anvil, of which nothing but the shadow was formerly believed to exist. He proves that states of consciousness are shadows accompanying cerebral functioning; he shows that the cause of action lies in the cerebral functioning and not in the shadows which accompany it. For all men up to a certain age, and for the vast majority of men of all ages, that screen is never removed; they never learn that physical processes are invariable concomitants of mental processes. They are only aware of the mental processes and of the outward result. Necessarily they are bound to attribute the one to the other. The case is, indeed, far stronger than is indicated by the analogy. For the analogy deals with only one kind of action; whereas psychical processes are of innumerable kinds and the connection between particular feelings and particular motions is welded by years of experience. Need we wonder that men hesitate to recognise the illusory nature of the causal sequence?

In his interesting work *Body and Mind* Dr. M'Dougall attempts to demolish epiphenomenalism. This work, though I am entirely unable

to agree with it, gives the case against mechanism in a far more scientific and valuable form than does Bergson. And it is interesting to note how little really can be said against the theory, even in competent hands. Dr. M'Dougall attacks epiphenomenalism on various grounds. Firstly, the 'biological argument from continuity,' 'for the appearance of consciousness at some undefined point in the course of the evolution of the animal kingdom, as postulated by it, constitutes a distinct breach of continuity.' I really cannot see what biological continuity has got to do with it. We have to deal with the fact of consciousness and the fact of cerebral activity. If we go far enough back in evolution, we either have to suppose that consciousness began somewhere, or that it is a property of all matter, inorganic as well as organic. I cannot personally see any *a priori* objection to either hypothesis, or any possibility of ever ascertaining which is correct. Nor can I see how either of them would affect epiphenomenalism one way or the other.

Still more irrelevant is the 'argument from inconceivability.' Epiphenomenalism does *not*, as Dr. M'Dougall alleges, say that 'material

processes generate consciousness out of nothing'; nor does it offend against the 'law of causation.' It affirms *absolutely nothing* save that mental states are found invariably accompanied by physical states. It does not say that the physical *cause* the mental states: I should object to such an expression as being applicable only to material phenomena. It says only that they are *accompanied* by mental states, without expressing any opinion as to the generation of those states, or the nature of their dependence, or their cause, or anything else whatever about them, except the one fact given by experience that they are found to accompany definite cerebral conditions with exact regularity. Cause applies only to matter and motion: it cannot be alleged in stating the connection between mind and body. All we know is that the connection is invariable: and beyond that there is nothing more to be said.

Dr. M'Dougall's next objection is that epiphenomenalism is 'in direct opposition to the overwhelmingly large majority of philosophers of all times and of all races.' But so was organic evolution before Darwin: so was our solar

astronomy before Copernicus. Moreover, the opposition is least among those who know the facts best. Physiologists, by Dr. M'Dougall's own admission, have very generally adopted it: and persons who are not physiologists are not competent to judge. The opposition to epiphenomenalism is exactly proportional to ignorance of the facts: and a poll of physiologists would not improbably disclose a majority in favour of the theory. Yet that is all that Dr. M'Dougall has to say against the theory. Surely there is nothing here to deter us from it.

It is often argued that, although the great majority of human activities are in the last analysis purely automatic or mechanical, yet where judgment or choice is exercised, there consciousness does in fact break into the physico-chemical sequences. This, I gather, is Bergson's view. It abandons nearly the whole of mental workings to mechanism, but makes a last attempt to save spiritualism, in the sphere where its disproof is most difficult. The adherents of this view liken the action of mind to that of a spark on gunpowder. They admit that the energy used is

mainly material; but they think that where the automatic reaction is nicely balanced between two or more possible outlets, mind may step in and direct it into one or the other. This is a subtle attempt to defend the principle of mind acting on matter, without breach of the law of conservation of energy. But the attempt fails. For energy cannot even be directed, without the addition of more energy, however slight. The gunpowder is in a highly unstable condition—in such a condition that a very minute external influence will suffice to disintegrate it. But that influence is a *sine qua non*; and it must be of a strictly material order. Making passes at it will never explode it; some material energy, however slight, must be used. So also with mind and body: the one cannot act upon the other without some employment of material energy, that is to say, without some creation of new energy which would completely traverse the fundamental doctrines of physics. The attempt to save the principle of conservation of energy by reducing the conscious interference to a vanishing point, is like the excuse made by the young woman for having a baby—namely, that it was only a very

little one. But unfortunately the breach of principle is just the same, however small it is.

But why assume a sparking action by the mind, when there is no need for it? Does the theory not bear on the face of it the appearance of a last desperate attempt to save a discredited principle? What solitary particle of evidence is there in its favour? If the whole Universe is explicable by physical laws, if the origin of the animal and plant kingdoms is likewise so explicable, if the evolution of life along its innumerable branches has no other cause, if nearly the whole of human activities are admittedly to be ascribed to it, we must surely look for some very solid grounds for accepting the view that in one small portion of human activities only, a wholly and radically novel process takes place. That this should happen would be a miracle of the most incredible character: but that it should be held as the last refuge of a theory, driven back by degrees within smaller and smaller limits, is what we should naturally expect.

The physico-chemical theory affirms, then, the universal domination of physical law. It denies the existence of any 'spirit' breaking into

mechanical laws. To those who affirm such existence it has but one question to ask:—where is your evidence? It will not be put off with child's talk about introspection and direct intuition. Facts are required, and facts alone can settle the question. Every human achievement in science, commerce, and the arts has been reached solely by means of physical law. By physical law alone can we explain the movements of the planets, prophesy eclipses and astronomical events, which enable sailors to navigate the ocean in perfect security. By physical law alone can we forecast what parts of the earth's surface are likely to overlie coal or minerals. By physical law we are able to build houses, make machines, and do all the other wonderful feats of civilisation. By physical law we are able to recognise disease, its causes, and its cure. By physical law we are able to foresee the results of different motives acting upon masses of mankind. In none of these cases has there been any intervention of spiritual influences: for any such intervention must upset our calculations, which only consider physical facts. If then everything that has ever been accomplished

by humanity is based upon the assumption of invariable physical law : if all the facts of which we have experience converge to the same conclusion : surely we may ask the spiritualists—what can you prophesy, what have you ever done for humanity, what facts can you show us ? And if they can give us no facts, can do nothing for humanity, can make no prophecy that may be verified, we shall then see in their hypothesis nothing but the same rotting and putrescent metaphysical corpse which received its deathblow at the hands of Bacon and Descartes several centuries ago.

CHAPTER VI

THE ORIGIN OF FALLACIES

'He that is giddy thinks the world turns round.'

SHAKESPEARE.

WHEN criticising Bergson's philosophy, I attempted to indicate some of the logical fallacies on which it appeared to be based. Such fallacies were those of the false analogy, misuse of words, premature generalisation, paralogism at large. More important, however, than the logical causes of fallacies are the psychological causes. What is the origin of the state of mind which leads men to false beliefs? The rules of logic are clear and well known. Yet the knowledge of these rules has never gone far towards saving men from breaking them; the origin of fallacies must therefore be much more deeply rooted than is implied in merely overlooking the well-known precepts of logic.

The question as to how men come to contract

beliefs that are opposed to facts, is but a special case of the more general question as to the origin of beliefs at large. What is a belief? Let us get rid of the psychical fact altogether, and fix our attention on its physiological counterpart. For if the foregoing chapters are correct, it follows that a belief may be looked upon as correlated with some specific structure in a part of the brain. The question then arises, as to whether it is acquired or congenital. The easiest way to solve this question is by looking to see whether beliefs are hereditary; for we know that congenital characters are likely to be inherited, while acquired characters are not. The result of such an inquiry appears to be that, whereas the specific details of belief are purely acquired, the tendency to believe along certain general lines is congenital. Thus I should suggest that, in religion for instance, the particular dogmas and details of a creed are acquired by education; while congenitally there is a tendency to believe in the supernatural, which is inherited merely as a vague and undefined feeling, readily becoming specific and defined under the influence of teachings harmonious with it. We seem to be driven

to this opinion by the very wide, though not universal existence of a belief in the supernatural. We in England, adhering to Christianity, which does not embrace one-third of the population of the world, shall have no difficulty in admitting that the bulk of that religious opinion is erroneous. We shall agree that if a man is taken at hazard from somewhere on the Earth's surface, there are strong probabilities that he will have a religion of some sort, and that his religion will be for the most part or entirely erroneous. That is to say, that the real origin of religious beliefs is an innate and congenital tendency to believe in the kind of things that a religion teaches—the tendency being rendered definitive by the particular teaching acquired during childhood.

In order that I may not be suspected of trying to manufacture a case against opponents, let me hasten to add that there is just as strong evidence in favour of the innateness of the beliefs which I have endeavoured to support, as for the opposite beliefs. The Aristotelian-minded philosophers appear to derive their community of belief from a strong resemblance in congenital mental features. An inspection of the more extreme among them

discloses a number of characteristics held in common. They have generally been atheists: they have been radicals in social life, tending in modern times towards socialism or republicanism: they have been rebels against authority, despising the conventions of social life, as well as the mandates of superiors in their hierarchy: they have had a strong scientific leaning: they have been conspicuously destitute in the historical sense (as is often pointed out by Lange): they have been indifferent to art: their style of writing has always been singularly lucid (Epikurus, Hobbes, Büchner, Spencer): they have been contemptuous of book-learning (*e.g.* Hobbes' remark:—'If I had read as much as other people, I should probably have known as little'; so also Demokritus and Spencer). Of course, I am aware that numerous exceptions may be called up to most of these features. I may be reminded that Gassendi had a strong historical sense: that Hobbes is the great upholder of monarchies: that Omar Kayyám, Leonardo da Vinci, and Goethe were great artists: that Hartley was a churchman. Nevertheless there is a very pronounced *general* resemblance of character, which

is especially conspicuous when compared with the opposite school.

We seem, therefore, to be justified in assuming that beliefs are the outcome of a congenital disposition. The individual is born with a certain mode or tendency to belief: and if during life he is brought into contact with theories harmonious with that tendency, he is likely to accept them. Here then we at once see the ultimate origin of fallacies. Whether a man believes in a true theory or a false one appears to be a matter of heredity as much as anything else. He derives from his ancestors his mental tendencies just as much as the shape of his nose. If he lives in an enlightened period, those tendencies will of course crystallise in a more reasonable form than if he had lived in a period of ignorance. That tendency which will make a man famous in one age, will leave him in obscurity in another. If, then, beliefs are largely due to chance, why are not fallacies more widespread than is actually found? Natural selection must have operated powerfully: those whose congenital tendencies cause them to espouse true beliefs will survive and have offspring, while

those whose congenital tendencies lead them into error will die out. Moreover, we shall expect, on this theory, to find that fallacies are most rampant where natural selection is least operative. May we not see here a cause for the survival in metaphysics of the method of 'intuition' long since abandoned in practical life? For a metaphysical system can have little survival-value for the individual that holds it.

Now I wish to carry the hypothesis a step further. Sir Ray Lankester has shown that the intellectual progress of mankind has been accompanied by a loss of instinct, and a gain of 'educability.' That is to say that a lower animal, for instance, has a great many instincts, and can *do* a great deal when it is born without education, but that it has very little power of learning anything further by experience or education. Man, on the contrary, is born with singularly few instincts or capabilities of acting: but instead of this, he has enormous capacities of being educated. The brain of man approaches a *tabula rasa* (as affirmed by Helvetius) on which can be written a very great deal that was not originally implicit there. The brain of a lower animal has already

been written upon, and not much more can be done with it. Its innate characteristics are a bar to the acquisition of foreign conceptions. Applying this general theory to the special case of beliefs, we may gather that the primitive and congenital *tendency to believe* along certain lines is likely to weaken with evolution, giving place more and more to a completely open mind, in which the *tabula rasa* is realised to so great an extent that *any* doctrines presented will be assimilated or rejected with equal impartiality. In a low type of mind, we should expect to find the range of possible beliefs closely limited by the congenital tendency; in a high type of mind, we should expect to find the various possibilities of belief far greater in number, and the beliefs themselves more emancipated from the weaker instinctive feelings. That this is just what we do find is so manifest as to call for no illustration. The man of enlarged intelligence is prepared to accept, within limits, almost any proposition when he is shown solid reasons for believing in it. The undisciplined mind, on the other hand, is prepared to accept nothing that is not in harmony with its original bent; it is

securely bound by the shackles of its own constitution: we call it narrow, and the name is something more than a mere analogy.

It appears to me that in this progressive release of the mind from its congenital tendencies of belief, we have the physiological counterpart of the movement which I described in Chapter IV. I there endeavoured to show that the progress of philosophy, in so far as it differs from positive science, is a removal of the superstitions and fallacies which cumber the path of true knowledge. The work of philosophy is done when the ground is thoroughly cleared, when no further obstacle remains to bar the advance of science. Now these obstructive superstitions and fallacies are the outward and visible sign of instinctive tendencies that are out of accord with objective facts. Their destruction leaves the mind *tabula rasa*, on which the results of experience may be recorded; in the history of philosophy, we see the record of a real step in the mental evolution of man. Beginning at an age when man was dominated by congenital instincts to the almost complete exclusion of acquired experience, history shows the gradual loss of

those instincts, corresponding to a gain in educability, a gradual progress to that highly cultivated mental condition, in which all truths presented by nature are accepted with equal readiness, without emotional drag. We see also that Bergson, in his admiration of instinct, has selected just the very quality which it is the chief business of philosophy to eradicate. The errors of which his metaphysics consist rest upon the same standard of belief that actuated man before the dawn of science.

Psychologically, the above facts are spoken of as the influence of feeling or emotion on belief. Everybody knows that obsession of the mind by a powerful emotion excludes the entry of all conceptions, that oppose the emotion, and conjures up all sorts of conceptions, true or false, that gratify it. A man in love sees nothing but extravagant virtues in his mistress—a commonplace woman. A man in terror sees the approach of danger in the most harmless occurrence. A man of jealous constitution will for ever be creating fancied occasions for jealousy.

> 'Thou art not ever jealous for the cause;
> But jealous, for thou 'rt jealous.'

A man who is always on his dignity will believe that his friends are constantly slighting him, and so on. These observations are so common that there is no need to delay over them. I come at once to the feelings which are chiefly injurious in the realm of philosophy.

The strongest feelings which affect humanity are those which ensure the preservation of life, and the perpetuation of the species. The feeling in favour of self-preservation is of such strength as to offer the most emphatic welcome to all theories which affirm a continued life after death, and to reject emphatically and angrily all opposing theories. Hence we may expect to find widely spread among humanity a conviction in an after life—a feature which, amid their manifold diversities, most religions possess in common. We may expect also that this conviction will begin to weaken only when culture and discipline have cleared the mind to an advanced point: we may expect that the conviction will be most powerful when the intellectual discipline has been feeble.

The influence of the reproductive emotions is more obscure in operation, but no less profound.

It is possible that they are the supporting fabric of the whole of religious asceticism. Frenzy in these two spheres is well known to lead to self-tortures of an incredible description, and similar in kind. I referred to the Greek Cynics as a likely instance of the connection. Sokrates may have been another case. The terrible deed of Origen offers us a clue. Sexual crimes are known to be relatively frequent in religious paranoia. Just as certain phases of religious belief are based on perverted sexuality, so it appears probable that metaphysical systems may often have a similar foundation. A deep organic emotion must have sustained Benedict Joseph Labre, who gave up his body as a breeding ground for lice; or Simeon Stylites, who bound a rope round himself which became imbedded in his flesh and caused putrefaction, so that an intolerable stench was produced, and worms dropped from him whenever he moved. Let me pass hastily from so disagreeable a topic.

The errors of Plato's metaphysics are plainly due to emotional interference. He expressly set up the æsthetic and other sentiments as the test of truth. The Ptolemaic astronomers were

similarly deluded. They argued that the heavenly bodies could move in no other orbits but circles, since a circle alone was a perfect curve. The apparent movements were accounted for with extreme ingenuity by their systems of epicycles, or circular wheels. On the rim of the largest wheel was fixed the axle of a smaller. On the rim of this again was fixed the axle of yet another wheel; and by supposing revolutions of all these wheels together, it was found possible to explain the motion of a planet with marvellous approximation to accuracy.

The love of harmony and completeness for a theory has led to innumerable false systems of philosophy. Leibnitz is a specially conspicuous instance. The belief in teleology has an exactly similar foundation. It is an unpleasant thought that the Universe has in it no beneficent intention, that we are purely the sport of mechanical laws. Hence that belief, however plainly facts suggest it, will not be easily received.

The Ecstasy of the Alexandrian school is a definite abrogation of intellect in favour of emotion. Much modern mysticism has the same foundation.

The ethical sentiments, admirable and necessary though they are, frequently intrude into purely intellectual spheres. Men are apt to be guided by their opinion as to what morally 'ought' to be, when they are inquiring as to what actually 'is.' An interesting example was afforded by Mr. Arthur Balfour in his article on Bergson in the *Hibbert Journal* for October 1911. The admirable philosophic and scientific tone of that article, indeed, constitutes it one of the best English criticisms of Bergson that has yet been printed: and in singling out what appears to me a fallacy, I must not be understood as wishing in any way to belittle the merits of a valuable essay. Mr. Balfour defends freedom of the will 'partly because, on ethical grounds, I am not prepared to give it up.' Now ethical grounds can have nothing possibly to do with the *fact* of freedom or necessity. A fact is none the less a fact, if its moral consequences are injurious. Of course I emphatically repudiate the suggestion that injurious moral results could conceivably flow from mechanism: I believe the contrary is the case. But, however that may be, Mr. Balfour's argument amounts to this: freedom is ethically

desirable—therefore freedom is true. It *ough* to be true; therefore it *is* true. I venture t think that Mr. Balfour has allowed his mora enthusiasm to run away with the facts.

The bearing of determinism on moral re sponsibility, although irrelevant to its truth as a theory, is so important as to justify a brie digression.

Mankind are so constituted that certain acts called anti-social or criminal acts, arouse among them hostile emotions against the offender. How do these hostile emotions come to be implanted in humanity? In just the same way that the other structures and functions of the body are developed—viz., by natural selection. Societies in which anti-social acts arouse no hostility fall to pieces in consequence. Only those societies can survive in which anti-social acts call forth among the people hostile emotions bringing about an attack upon the offender, and his suppression. No society can reach a high civilisation unless throughout their members there exists the nervous organisation which supports the sentiments of anger and hostility against criminals: and this physical nervous organisation

is the groundwork of what we call our moral code. We can now easily see that no theory of determinism can affect moral responsibility. We shall continue to condemn crime, and to visit our wrath upon criminals, just so long as we continue to feel hostility towards criminal actions: and if we ever become so civilised that the feeling of hostility dies out, that time will mark the commencing disintegration of our society. It is the vice of the Lombroso school of criminology to interpret determinism as though it were fatalism, and under this fallacy to advocate the relaxation of moral responsibility. A wider comprehension of scientific determinism would enhance rather than diminish the sentiments of morality.

Many people will be loth to admit that there is any opposition between the quest for truth and the quest for morals. Certainly, in the question of freedom, I can see no such opposition: but in other questions, I think we must recognise that there is no pre-established harmony between the two. Let me take instances. Many philosophers have held that religion was false but necessary for morality. I am not about to discuss the

veracity of this opinion: I wish only to affirm that there is no contradiction in it, logical or other: that the opinion may very likely be true: that its truth or untruth can only be attained by appealing to experience. Hobbes laid it down as a right policy for a sovereign to erect a superstition into a religion, if it appeared to be for the good of the people. Voltaire justified a belief in religion on the same grounds. I may add another. Supposing that the public could be induced to accept the superstition that the soul of a man after death entered into the body of a new baby at hazard,[1] might not the stimulus for social amelioration be enormous? Black distress and poverty might soon be cleared away, if the public could be made to think that, so long as it remained, it might be their own fate before long. I do not know whether this would be so or not; I only wish to emphasise that the quest for truth and the quest for morals are not necessarily associated.

Montesquieu fell into this error when he said

[1] An F.R.S. has recently published a book in favour of this theory. I am driven to suppose that he has delivered himself of this preposterous nonsense for the purpose of deluding the public for what he thinks their advantage.

that laws 'are the necessary relations derived from the nature of things.' This is true for science; it is not true for ethics. When it is a question of formulating facts as is done by science, then laws may be defined after the manner of Montesquieu. But about human-made laws, or the laws proposed by ethics, there is nothing whatever to do with the 'nature of things.' Ethical laws are simply statements of what we think *ought* to happen, or what we intend *shall* happen. They are relative to us. Scientific laws state what facts exist: they are altogether independent of us, and of our 'oughts' and 'shalls.'

As regards materialism, Rudolf Wagner denied it and Czolbe asserted it, both alike on the wholly irrelevant grounds of a 'moral feeling of duty.' Whether materialism is true is one question: whether it is wholesome for the public is another. Neither truth nor public welfare is likely to be advanced by confusing them.

A further instance of the moral bias we may adduce from the *Meditations* of Marcus Aurelius. In his constant endeavour to depreciate pleasure, he alleges that the good man may be happy

while tortured. I am not going to deny the possibility of it: but at best it wants proof, and none is offered. Yet the myriads of people who have read the *Meditations* probably accept it to a very large proportion, because it has an agreeable sound. The appeal is not to intellect but to emotion.

The philosophy of Sokrates was vitiated by its complete abandonment of science for ethics. The moral fallacy, as Lange justly observes, 'thoroughly corrupted' the physics of Aristotle. Part of the benefit of a scientific training is no doubt due to the frequent compulsion to accept undesired beliefs and to abandon cherished convictions. The compulsory recognition of unpleasant facts is the best possible mental discipline preparatory to the study of Nature. The frequency of the 'moral' fallacy is gradually becoming widely perceived: it seems to have deeply influenced Nietzsche, who is now widely read.

It remains for me to apply these observations to the metaphysics of Professor Bergson. That unfortunate philosopher appears to have accumulated within his works innumerable ex-

amples of almost every kind of fallacy that human nature is subject to. His 'Huxley' lecture at Birmingham in May 1911, printed in the *Hibbert Journal*, constitutes a veritable storehouse of the kind of fallacies we have been considering.

'In my opinion, the aspirations of our moral nature are not in the least contradicted by positive science,' says the Professor. Why then is it that the chief obstacle to scientific progress in the past has been the aspirations of moral nature in our predecessors? The aspirations of the moral natures of the Ptolemaic astronomers demanded perfect circles for the planetary orbits. Are they not contradicted by the fact that these orbits are imperfect ellipses? The moral nature of men was not only contradicted but shocked when they were informed that they were descended from ape-like ancestors. The disease and suffering which overwhelm mankind must contradict the moral aspirations of any one but the most brutalised. The whole history of scientific discoveries, which have been hailed as immoral, have plainly contradicted the aspirations of contemporaries.

'How could there be disharmony between our

intuitions and our science, how especially could our science make us renounce our intuitions, if these intuitions are something like instinct—an instinct conscious, refined, spiritualised—and if instinct is still nearer life than intellect and science?' It is perhaps unkind to select a passage from a peroration, more especially since its error is so obvious. What is the good of asking us how there can be disharmonies between intuition and science, when every body in the world except metaphysicians knows that there *is* such disharmony? I have attempted to exhibit the function of philosophy as the eradication of false intuitions, leaving the mind *tabula rasa* for empirical knowledge. Bergson would have us believe that the intuitions *must* be right: why then does history show that they have constantly been wrong? And why do men have such diverse intuitions on the same subject? Surely not more than one of them can be right, and then it follows that the rest are wrong. Bergson appears, so far from having cleared his mind of the original weeds before he began his philosophy, to have carefully cultivated and manured them: he now shows them off as fine plants.

Undoubtedly their growth is luxurious, far more luxurious than is known among more valuable plants; but they are just as much weeds as they were at the beginning.

In this same 'Huxley' lecture, Bergson furnishes another instance of belief justified by emotion. 'Philosophers who have speculated on the significance of life and the destiny of man have not sufficiently remarked that Nature has taken pains to give us notice every time this destiny is accomplished; she has set up a sign which apprises us every time our activity is in full expansion; this sign is joy. I say joy; I do not say pleasure. Pleasure, in point of fact, is no more than an instrument contrived by nature to obtain from the individual the preservation and the prolongation of life; it gives us no information concerning the direction in which life is flung forward.' Of course I dispute the terminology from beginning to end: I do not know what is meant by life being flung forward: that, however, is not my present point. What I wish to emphasise is the confusion between feelings and outward facts. It is alleged that 'the direction in which life is flung forward' is indicated

by the sentiment of joy. Let us now note how completely observation negatives Bergson's sentimentally derived result.

(1) Joy does *not* accompany the full expansion of our activity. Otherwise we should be animated by joyful emotions when running a mile race, or working out a mathematical equation. Joy is distinctly characteristic of states of diminished activity, when there is no strain on any faculty, but rather a gentle stimulus on them.

(2) Why should Nature wish to apprise us when our activity is in full expansion?

(3) Why should she have selected joy as the sign of such full expansion? Before Bergson, nobody had ever previously marked the significance of the sign: it was lost upon all pre-existing humanity, and Nature's purpose, therefore, remained unfulfilled. The old teleological notion was that the moon was placed in the sky to give illumination by night. The notion was condemned when people observed that the moon was in the sky as often in daytime as in nighttime; and that even at night, it was less than a half moon for a fortnight in every month. But

that teleological absurdity is as nothing to Bergson's. For he posits 'joy' as teleological: it is a sign (which no one can be expected to recognise) to inform humanity of what it is entirely useless for them to know!

Bergson goes on to inform us that true joy 'is always an emphatic signal of the *triumph* of life.' This sentence, with its context, is intended to convey an impression like the fanfare of trumpets. Yet the cold analyst must ask what it *means*. Philosophy is not advanced by high-sounding sentences: we want to get at real meanings. Darwin has remarked in his 'Expression of the Emotions' that joyousness is a main characteristic of a large class of idiots: an observation which is endorsed by every alienist. Are we then to infer that the triumph of life is most emphasised among idiots? We need no further instances of the extreme absurdities in which Bergson is landed by his emotionally-inspired *obiter dicta*.

Thus while, in a former chapter, we saw the numerous logical fallacies contained in the Bergsonian metaphysics, we now are able to contemplate their psychological origin. Instinctive

feelings, which in science are a main obstacle to knowledge, are here taken as a *means* to knowledge. The fallacy is at the root of every other system of metaphysics ever invented. Metaphysics is discredited even more by its psychological origin than by its logical methods.

CHAPTER VII

THE TRUE PROVINCE OF PHILOSOPHY

'. . . Grey are all theories,
And green alone Life's golden tree.'
GOETHE

I HAVE endeavoured to show that there are two elements of positive value in philosophy: the one, increase in our positive knowledge and more correctly described as science; the other, dissipation of error. Among the Greeks all branches of knowledge were confused under the name philosophy. With advancing civilisation, the various divisions came to be marked off constantly more sharply from one another. Science has completely broken off; and Theology is more or less independent. But there are still comprised under the term philosophy a number of separate studies, some of which deal with real facts and approximate to science, others which

deal with pseudo-facts and approximate to metaphysics. Such are psychology, ontology, epistemology, logic, ethics, etc. The ultimate goal of philosophy will have been attained, when all of these have either been recognised as branches of science, or condemned as products of superstition and ignorance. There is no room for a class of 'moral science' intermediate between natural science and metaphysics.

Ontology need not detain us: the attempt to solve the ultimate riddle of existence, in such a way as to satisfy our curiosity, is plainly futile. Epistemology, the science or pseudo-science which treats of the validity of our knowledge, appears to me to have no more secure basis than ontology. It suffices that *relatively to ourselves* our knowledge is valid. What may hold good in the absolute is a question beyond the range of facts or evidence, and therefore childish to discuss. Psychology, on the other hand, is now almost completely emancipated from philosophy, and takes rank as one of the special sciences. In the future its position will, no doubt, be fixed as one of the departments of nerve physiology. Logic similarly has become a science. It has,

indeed, made no great advances, nevertheless its province—that of laying down rules for the evaluation of evidence and for methods of research—is a clear and legitimate region for science to occupy. Ethics, similarly, is or will become a branch of science of very great importance. The regulation of conduct and social life can only be successful when founded upon a set of scientific inductions as to what kind of conduct is most conducive to human welfare. But we have far to go yet in physiology and psychology before a reliable system of ethics can be built up. Metaphysics, according to the views adopted in this work, is hopelessly and permanently discredited. Does nothing remain, to which the title of philosophy may be applied?

The philosophy of Herbert Spencer, with the exception of the short Part I. of *First Principles*, is a philosophy into which metaphysics does not enter. Spencer defined philosophy as the science which deals with inductions of a wider generality than any of those covered by the special sciences. Just as the generalisations of biology are of wider scope than those of

morphology, physiology, embryology, etc.; so, according to Spencer, the generalisations of philosophy are those which hold good, not of biological data only, but of astronomical, geological, psychological data, in short of all orders of phenomena whatever. According to this view, physics should be erected to philosophic rank. For its laws—such as the conservation of energy, and the laws of motion—are likewise applicable to every order of phenomena. Indeed, by an inspection of his philosophy, we find that Spencer's philosophic laws are really laws of physics, and their validity is to be decided by physical principles. The general opinion appears to be opposed to their validity; but it may be remarked that, even on a favourable supposition, no single principle of the smallest practical importance has ever at any time been deduced from them. Unlike Newton's laws, which carried with them vast results for human knowledge and welfare, Spencer's laws have hitherto been completely barren.

There appears, therefore, to be nothing else whatever to bring under the name of Philosophy in the future. Parts of it will continue to branch

off as true science, and as such to flourish and multiply; others will branch off as metaphysics, and so decay and disappear. Ignorance, superstition, and pseudo-knowledge will ultimately be vanquished. It is in this last sphere that the most important work still remains to be done. For the workings of 'intuition,' and of the pseudo-knowledge which arises therefrom, have to be combated not only in the sphere of belief, but also in the sphere of conduct. Nothing can be conceived of greater importance to an individual than a correct 'philosophy of life': a guide to conduct beyond and in addition to those inculcated by ethics. If men are animated by superstitions in the sphere of belief, it is no less true that they unthinkingly adopt many false principles in the sphere of conduct. It is a work of fundamental importance for philosophy, to destroy the superstitions, not only of thought, but also of action.

It was assumed by the older psychologists, especially by Jeremy Bentham and his disciple James Mill, that the sole prompting of human actions arose from the desire to avoid pain or to secure pleasure, in the widest sense of the words.

They undoubtedly went too far. It is plain that this *would* be the end of life, if men were rational beings: it is plain that it *ought* to be the end of life. But it is not, for men are not yet rational beings: they have still their instincts to fight against.

A vast proportion of human occupations are due to mere habit of thinking and doing which has been acquired by chance or handed down by heredity. Certain aims or doctrines fill the mind so powerfully as to get translated into action quite irrespective of the pleasures or pains involved in them. The *idée fixe* is a much larger factor in human prosperity than most people are aware of. Obsessions seize the mind, and work it fatally in the direction they indicate. Just as looking over a high cliff may so enthral the mind as to admit no ideas from outside but compel the subject to precipitate himself down it by the mere irresistible force of suggestion, so in practical life minor obsessions are for ever swaying the mind and leading it to act out its preconceptions without the smallest regard to its own interest. When these obsessions are not anti-social, they raise no comment or hostility.

When they are highly social, they are encouraged, and the subject is held up to praise and admiration.

Now it is clear that all such obsessions are bad. They are not founded upon reason or forethought: their result upon humanity is a matter of pure chance: while in many cases they will happen to be advantageous, in many other cases they will happen to be deleterious. They are altogether inferior to those modes of activity which are the product of reasoned forethought, and which are thereby decided to be of beneficial import. They are false guides along the path of life. For every one the journey through life begins in darkness, and only increasing experience lights the way. Lanterns are put out to mark our road, the laws of science, or rather of Nature, on the one hand; and the laws of morality, or of Man, on the other hand. But besides these lanterns, whose exact location we should study well, the wayfarer is puzzled by innumerable will-o'-the-wisps which float away in the darkness before him, and are all too likely to be mistaken for the true beacons. These will-o'-the-wisps are not animated with any

special hostility to him. He may follow one which travels straight along the right path; he may, on the other hand, be led into an inextricable bog: and in almost every case, there will be some deviation, resulting in exactly co-ordinate diminution of his life's prosperity. Many writers have taken pains to indicate these *ignes fatui.*

More than six centuries ago, they were stigmatised by Dante at the outset of his *Divina Commedia.* Wandering in the valley before he met Virgil, he was in danger of losing his path on three distinct occasions. On the first, it was a beautiful spotted leopard whose gorgeous colours nearly led the wanderer to an acquaintance which would have been fatal to him. On the second and third, he was terrified by a roaring lion and a she wolf. The lion is ambition, the wolf is avarice, the beautiful leopard is luxury.

Spinoza, similarly, in his earliest work *On the Improvement of the Intellect*, specifies *Divitias, honorem, atque libidinem*, as the objects in which men think that supreme happiness consists. Goethe, also, in his masterpiece, put into the mouth of Faust a condemnation of the

vanities which he had discovered in his experience of life :—

'Cursed be at once the high ambition
Wherewith the mind itself deludes !
Cursed be the glare of apparition
That on the finer sense intrudes !
Cursed be the lying dream's impression,
Of name, and fame, and laurelled brow !
Cursed, all that flatters as possession,
As wife and child, as knave and plough !
Cursed Mammon be, when he with treasures
To restless action spurs our fate !
Cursed when for soft indulgent leisures,
He lays for us the pillows straight !
Cursed be the vine's transcendant nectar,—
The highest favour Love lets fall !
Cursed, also, Hope !—cursed Faith, the spectre !
And cursed be Patience most of all !'

Byron wrote in a similar strain :—

'Few mortals know what end they would be at,
But whether glory, power, or love, or treasure,
The path is through perplexing ways, and when
The goal is gained, we die, you know—and then?

The pessimism of Schopenhauer appears to be partly founded on irrational intuitions. The conception of life put forward by him and von Hartmann is that happiness can never be found ; for mankind are ever striving to satisfy unfulfilled wants : and if they fulfil these, *ennui* instead of satisfaction results, driving them

continually to the invention of new wants. This philosophy would be natural enough to one who followed *ignes fatui* too confidently.

Schopenhauer gathered only pessimism from knowledge. Far more profound was the great materialist de Lamettrie, who laid down the general principle :—' Plus on a d'esprit, plus on a de penchant au plaisir.' Pailleron in his fine play *Le Monde où l'on s'ennuie*, has admirably exposed the fallacious life-doctrines, to which I allude. I now proceed to indicate the influence upon a true philosophy of life, of those mechanistic and determinist doctrines that I have advocated in this book.

In the first place, it ought to be a matter for universal rejoicing that the Universe is swayed wholly by physical law. For, by means of science, we can discover physical law, and utilise it for our own advantage. If there were any breach in the regularity or universality of law, our inductions would fail us, and our efforts to ameliorate our lot would be frustrated. Metaphysicians like to think of 'spirit' as an independent variable, not subject to any law or regularity of operation; and therefore never capable of

being brought under human control. The doctrine of mechanism, on the other hand, is a doctrine of hope. It holds out to mankind the highest prospect of success in their efforts to control and improve their environment.

The notion of the Universe which we have adopted is simply that of matter and energy undergoing transformation and redistribution in certain precise ways which we call the laws of physics. We have seen reason to believe that animals and plants are as completely subject to physical law as is inorganic matter. The matter composing an organism is synthetised from inorganic matter, by natural physical processes: on the death of the organism it undergoes decomposition, and becomes inorganic once more. So too, the energy contained in an organism is derived from the ordinary external sources of energy: it undergoes transformation in accordance with physical law, and passes out of the body into inorganic matter once again. In short, an organism represents a little whirlpool of matter and energy. At certain points in their redistribution there spring up these centres of activity where the matter and energy are con-

centrated into a sort of knot or whirlpool, drawing to itself copious supplies of matter and energy from without, and as constantly sending them back. We found that there was no obstacle to prevent an infinite science and an infinite mathematics from prophesying every future event in the Universe, and looking back upon every past event. Yet our own particular whirlpool discloses to us the existence of consciousness, whose existence we could never have suspected if we had looked purely outward. And by the law of continuity we are driven to assume the existence of consciousness not only in all other human beings, but in lower animals, down possibly to the very lowest. But when we examined this new factor of consciousness, we found it to be possessed of no significance whatever, in accounting for the changes and events which occur in our visible or tangible universe. In vain did we examine the innumerable attempts made by metaphysics to give it an active rôle in affairs: not one of them, we found, had advanced our knowledge or understanding by a hair's breadth. In vain we turned to science: science at all events can explain and

prophesy: science can achieve results patent to every one: science can transform the face of continents: surely we shall learn here what part consciousness plays in events. In vain: consciousness is unknown to science. Astronomy, geology, biology, get on without it. Physics and chemistry have seen no traces of it. Mathematics never heard of it. In no department has any trace of its working ever been discovered; and we found ourselves reduced to regarding it as an inert accompaniment of certain cerebral processes, without ever knowing, postulating, or so much as guessing anything further about it. An unsatisfactory and irritating conclusion no doubt, not deserving our esteem or possessing any other virtue than that of being strictly in harmony with the facts.

But is this not fatalism and irreligion? No, it is not. Huxley has refuted both charges. On the ground of irreligion, he points out that this view has been held by the whole school of predestinarian theologians, typified by St. Augustine, Calvin, and Jonathan Edwards. Fervent Christians like Leibnitz and Hartley were largely instrumental in advancing it. In fact its origin

is largely due to the exertions of some of the best among men, and of the most orthodox among Christians.

And now for fatalism. Determinism is the statement of an ascertained fact: fatalism is an unhealthy mental effect wrought in an individual by learning that fact. Fatalism takes the point of view that it does not matter what an individual does, since all is predetermined and subject to law. Now the truth of determinism not being in any way affected by its results on humanity, wholesome or unwholesome, we have only to look and see what its results are, and rejoice or despond accordingly. And when we look, we find that it does in fact only give rise to fatalism among uncivilised races and persons of feeble intelligence. Determinism makes an Arab a fatalist: the knowledge of determinism has upon him a detrimental effect: he is not fitted to learn it. But did the knowledge of determinism have that effect on Calvin or on Jonathan Edwards? Did it have it upon Huxley himself? Where in the lives of these great men, who profoundly stirred humanity in favour of what they thought right,—where in their lives can we

find the signs of indifference and feebleness which we designate as fatalism? Determinism is a scientific principle, and it is true. Fatalism is an ethical principle, a mode of conduct, and cannot therefore be brought under the category of true or false, but only as commendable or regrettable. Determinism brings fatalism only to the feeblest minds. But for those who are strong enough it is better to know the truth, for on strong minds determinism will have an invigorating effect exactly contrary to fatalism.

It is characteristic of the type of mind opposed to determinism that its effect on practical life should be looked upon as bad or fatalistic. I now propose to show that on other types of mind its effect on conduct is just the reverse; that it leads to what may be called, for want of a better term, anti-fatalism. Fatalism is a resignation to fate in the bad sense: anti-fatalism is a resignation to fate in the good sense. Shakespeare stamped himself as an anti-fatalist, when he put into the mouth of Hamlet:—'There is nothing either good or bad, but thinking makes it so.' The actual physical sufferings which we experience in life are as

nothing compared with the forebodings and gloomy anticipations of suffering, which in most cases are never realised. With science and commerce in the highly developed state now attained, the amenities of life for the bulk of the people are superior to anything available even to kings and plutocrats two or three generations ago. Security from death and disease, from violence and misfortune, has never reached so high a pitch as at present. The amount of real suffering, apart from imagined or anticipated suffering, that falls to the lot of most people, has never been reduced to so low a level. If man were a reasonable animal his life would be a glorious progress of joy and happiness. But alas!

'Da er kein Elend hat, so will er Elend machen.'

He vitiates and poisons his existence in the fear that some unpleasant and improbable event will injure him! He is discontented with his position in society, with his income, or what not! And if in any of these he had a lift up, he would be equally discontented again. Yet the anti-fatalist will look upon all unavoidable evils as necessary

conditions of existence. He will not complain of bad luck, for he knows there is no such thing as luck: the evil had to be, and cannot be remedied by poring over it. He will not brood over a false step once taken: for he knows that the necessity for it was implicit in the nebula of our solar system myriads of ages ago, and that the consequences of it are similarly determined. Determinism causes the weak to court the evils in life: it causes the strong to court the goods in life. The religious belief of Benvenuto Cellini kept him happy and contented while starving in the filthiest of dungeons. It led the martyrs glorying to the stake. Their attitude was but one form of determinism: a belief that events follow a course absolutely pre-ordained, and therefore demanding no vain regrets or bitterness from ourselves. The religion of both Mohammedans and Christians has inculcated determinism. Among the less civilised Mohammedans, it has brought about fatalism; among the more civilised Christians it has brought about anti-fatalism. When the Scriptures advocate humility and reverence to God, surely that is the same thing as a con-

tented acquiescence in the unalterable facts of Nature.

There is yet one further principle, the defence of which has always constituted an important task of philosophy. It is a principle, perhaps exceeding in importance any hitherto mentioned. It ranks next after Truth as the highest virtue attainable by a philosopher or man of science : it is the principle of Toleration. Any limitation in the liberty of opinion or the liberty of speech is a bar to the progress of Truth. All frowning upon unpopular views is a defence of ignorance and superstition, and a brake upon the wheel of Progress. For we must remember that the Truth about a matter remains the Truth, whether we attack or defend it. One who brings forward a theory that we dislike does not alter the facts. If his theory is true, then we had better get over our dislike and accept it with thanks ; if it is not true, at any rate it is brought into the open where a public discussion can take place on it, and if it is found to be erroneous, it may be executed and do no further harm. If it had never been brought out, it might have continued to live secretly and do

unbounded harm for want of a refutation. In short, if it is true, it ought to be publicly proclaimed from the housetops; if it is error, it ought to be publicly exposed. In either case toleration is necessary; for otherwise the theory will lurk hidden in dark corners; and we shall either lose its benefits, or suffer from its errors.

Those to whom the human race owes the most have too often been those to whom it paid the least. For new views are as likely as not to be opposed to the prepossessions of the day. Anything which attacks our prepossessions is unpleasant; anything which is unpleasant prompts to retaliation, in the absence of the mighty principle of Toleration. The retaliation is gross and brutal in proportion to the grossness and brutality of prevailing civilisation and sentiments: it is an emotional condition and therefore inept and indifferent to Truth. In religious history, the facts are plain. So it has been in science and philosophy, from the earliest times to the latest. Anaxagoras had to fly his country for asserting that the sun was not the chariot of the deity Helios. The great Sokrates, who did more to urge a rigid sense of

duty than any other living man prior to Aristotle, was forced to drink the hemlock. Not forced in the literal sense, certainly. Sokrates was a determinist, and recognising his fate, met it with a true philosophic equanimity and unmoved happiness, which contrasted violently with the anguish of his friends. Sokrates spent his life in a determined war against error. He refuted one by one the fallacies of the Sophists, notwithstanding their popularity and fashionableness. The earliest among the great exponents of ethics, he was condemned to death for corrupting youth! Discredited as are the metaphysics of Plato, his *Dialogues* must remain a standard work for the exhibition of a certain kind of true life-philosophy.

If intolerance was rampant among the Greeks, it was still more so in Europe in the Middle Ages. Giordano Bruno did perhaps more than any other man to pave the way for the great intellectual awakening associated with the names of Bacon and Descartes. He espoused the astronomical system of Copernicus and travelled all over Europe, lecturing and making converts to the new discoveries. Bruno stood to Coper-

nicus in the same relation that Huxley stood to Darwin: as the great protagonist and fighting interpreter of the new theory. Like Huxley, he overflowed with energy, was full of wit, and utterly indifferent to the abuse of the crowd. Like Huxley, he compelled people to accept the truth, whether they would have it or not. Like Huxley's, his language was direct: he referred to the philosophers of Oxford as 'a constellation of pedants, whose ignorance, presumption, and rustic rudeness would have exhausted the patience of Job.' Rash language in barbarous times; but we must remember that in those days, the statutes of the University fined every Bachelor and Master of Arts five shillings for every point of divergence from Aristotle; and it was Bruno's mission to destroy the influence of that philosopher, sanctified as he was by centuries of implicit faith and stupid veneration. For seven years, he was kept in the Roman prison. At length his persecutors induced him to deny all his theories save one, the plurality of worlds. And for that one, he went to the stake with as little trepidation as Sokrates drank the poison. He was forced to kneel before the

cardinals and illustrious theologians to receive the excommunication and curses of the Church. The sentence of burning alive left him unmoved: —'I suspect you pronounce this sentence with more fear than I receive it.' At any moment a retractation would have saved him, but he would not give it. A week later he perished, silent and self-sustained, and his ashes were blown by the winds over the Campo di Fiora.[1] It is to the work of Bruno, and men like Bruno, that we owe all the blessings which civilisation brings us to-day.

In modern times the hostile sentiment towards the propagandists of unpleasant views expresses itself less barbarously; but it remains a powerful force in arresting the progress of prosperity. Priestley, the discoverer of oxygen, with strong inclinations to materialism, has exercised an immense effect in the progress of science. His reward during life was the hatred of the people, who attacked him and burnt his house down. To Jenner we owe the near extinction of smallpox, formerly one of the most dangerous and universal of diseases. Abuse and accusations of immorality

[1] Lewes: *History of Philosophy*, vol. ii.

were the chief thanks accorded to him by his contemporaries. The need for liberty and toleration is almost as great in the twentieth century as it was in the Middle Ages. The majority of people, taking only a statical view of society, do not even dream of the revolutions in habits and opinions that are destined still to be wrought; the vital necessity for the widest toleration of all views cannot therefore be adequately appreciated by them. Although the positive penalty inflicted upon benefactors is not so brutal as it was, there still remains in full force that blind, destructive instinct which makes the dog bite the hand extended to rescue it.

In general, all new discoveries that have any appearance of materialism excite dislike. The German materialists of last century proposed views which had indeed much that was crude and imperfect, together with much that was true. Their doctrines should have been examined with impartial criticism, under which the chaff would have been eliminated, and humanity would have profited by the grain. Instead of this, they were met by a storm of indignation and abuse; so that, instead of calm criticism, both sides adopted

an attitude of angry dogmatism, and no practical results issued. Humanity was doubly the loser: firstly, by the failure to benefit by whatever truth might have been elicited: secondly, by the failure to condemn whatever errors were involved, leaving these errors to circulate almost unconsciously and work mischief which should have been avoided. In England, similarly, many still remember the storm of hostility which met the materialist doctrine of organic evolution, now universally accepted.

Between the advocates and opponents of a doctrine, only that side has anything to fear from discussion which is likely to be refuted. Impartial discussion always makes for truth, and those who drag in emotion, only obscure the issue and prevent the elucidation of the Truth. It is in their interest to do this, only when their faith is weak. The stronger their conviction, the more will they welcome an opportunity to defend it by sound arguments, the greater will be their resentment against those who knowingly falsify the discussion by emotional heat. *Magna est veritas, et praevalebit* will be their motto.

Philosophy appears, therefore, still to have

before it a large sphere of usefulness in the break-up of erroneous intuitions about conduct. Parallel with this mental clearance, new principles will have to be elaborated in substitution: this will be the task of psychology and ethics. It will perhaps then be discovered that the true satisfaction of humanity is far removed from the idols they run after. Of the three divisions of mind, recognised in modern psychology, feeling, intellect, activity, it will perhaps be recognised that the first alone is paramount, and the last two subsidiary to it. The life of intellect and the life of action are what the public now look upon as most desirable. In the history of philosophy and of psychology, the influence of feeling[1] has nearly always been underestimated. Pierre Bayle took a step towards pointing out its importance. Rousseau went much farther. The psychology of Bain gave it great importance. Metaphysics, on the other hand, has scarcely recognised it. When psychology has taken its pro-

[1] I use this very vague word in the strict sense accorded to it in such works as Prof. Sully's *Human Mind*, to indicate those modes of consciousness which are, in a peculiar sense, affections of the subject. My suggestion is that happiness depends less on the immediate external stimulus than on the nervous reaction.

per place as a branch of physiology, it will perhaps be found, not only that feeling is the most important element of mind, but possibly also that it yields most when farthest divorced from intellect, and activity. The opposition between feeling and intellect has been emphasised all through this book. There is a corresponding opposition between feeling and activity: for the surest way of reducing feeling is by expending it in action. Hitherto, poets rather than philosophers, have taught us where to look for the deepest forms of happiness; and, not least, the poet whose inspiration came most direct from Nature and was least sullied by artificial ambitions:

'What is life when wanting love?
Night without a morning:
Love's the cloudless summer sun,
Nature gay adorning.'

CONCLUSION

PROFESSOR BERGSON'S philosophy is contained in three volumes. I here summarise my main objection to the fundamental doctrine of each :—

1. Time is a stuff both 'resistant and substantial.' Where is the specimen on which this allegation is founded?
2. Consciousness is to some extent independent of cerebral structure. Professor Bergson thinks he proves this by disproving a crude theory of localisation of mental qualities. Will he furnish evidence of its existence apart from cerebral structure?
3. Instinct leads us to a comprehension of life, that intellect could never give. Will Professor Bergson furnish instances of the successes of instinct in biological inquiries, where intellect has failed?

I venture to think that, until these questions are answered, we are not called upon to consider further the merits of Professor Bergson's philosophy.

INDEX

('*r*' signifies '*referred to.*')

ABELARD, 67.
Abstractions, tendency to materialise, 101-2, 130.
Abubacer, 131.
Achilles and the tortoise, paradox of, 111.
Affection, in relation to perception, 41-2.
Albertus Magnus, 133.
Alembert, D', 146.
Alexandria:
  early progress of science in, 127-8;
  philosophy in, 128-9.
Alexandrian School, Ecstasy of, 206.
Alpetragius, asserts the power of inspiration, 131.
Ammophila wasp, case of, 88-9.
Amœba, 85.
Analogy, use and misuse of, 57-9, 63-5, 78, 79, 101.
Anaxagoras, philosophy of, 113-14, persecuted for truth's sake, 237.
Anaximander of Miletus, doctrines of, 108-9.
Anaximenes, 108.
Animal spirits, 134.
Animals, characterised by instinct, 27;
  nervous system of, 28.
Antisthenes, 121.
Aphasia, sensory, 48-9, 98, 99.
Archimedes, 127.
Aristarchus of Samos, 127.
—— of Samothrace, 127.
Aristippus, 120.
Aristotelians, their community of belief derived from resemblance in congenital mental features, 197-8; *r.* 104, 106.
Aristotle:
  affirmed the empirical method, 122;
  but failed in its application, 123;
  demanded facts and observation of nature, 126-7;
  elements of value in his work, 107;
  his *De partibus animalium*, 126;
  influence of, on philosophy of the Middle Ages, 129-30;
  metaphysical taint in, 106;
  Nature, his theory of, 89, 90;
  physics of, vitiated by moral bias, 212;
  r. 28, 35, 110, 114, 123, 131, 133, 134, 239.
Asceticism, possible foundation of, 204-5.
Assassins, the, 131-2.
Associationism. *See* Psychology.
Astronomy, its method of considering time, 69.
Augustine, St., a predestinarian, 231.
Aurelius, Marcus, moral bias in his philosophy, 211-12.
Autricuria, Nicolaus de, case of, 132.

BACON, FRANCIS (Lord Verulam):
  inductive method of reasoning placed upon rational basis by, 135;
  list of fallacies, his, 136;

Bacon, Francis—*continued:*
mechanistic tendencies of, 132, 139, 141, 150, 194; *r.* 238.
—— Roger, cited on obscurity of diction, 5-6; writings of, 133.
Bain, Dr. Alexander, 243.
Balfour, Rt. Hon. Arthur J., his article on Bergson criticised, 207-8.
Basutos, a superstition of, 101.
Bayle, Pierre, writings of, 145, 243.
Beliefs, influenced by sentiment or emotion, 112, 120, 203-8, 211-15;
nature of, 196-202.
Bentham, Jeremy, doctrines of, 223.
Bergson, Henri:
Ammophila wasp, on, 88-9;
analogy—
between his philosophy and that of—
Arabic writers, 131;
early Greek philosophers, 110;
Fichte, 158;
Hegel, 159-60;
Heraklitus, 113;
false, in works of, 57-9, 63, 64, 79, 84, 95, 101, 195;
Balfour, Mr. A. J. on, 207;
body, his theory of functions of, 38;
evidence, lack of positive, to support his assertions, 7-8, 55, 75, 98-101, 195;
evolution, on three directions of, 80;
fallacies in his work, 212-18;
the Mannikin, 55-6, 59, 60, 72, 73, 88, 100;
Huxley, his attitude towards, 69-71, 90;
incomprehensibility of his theories, 7, 16, 32, 98-9, 103, 160;
idealism of, 91-2;
ignorance, will not confess, 89-90;
independence of consciousness, his theory of, 246;
Bergson, Henri—*continued:*
instinct in plants, on, 82-3;
intellect and movement, on relation between, 85-6;
intelligence and instinct contrasted by, 29-32, 33, 59-62, 86, 87, 203, 246;
intuition, his theory of, 8, 31-2, 33, 59-62, 136, 214;
lesions, on, 40-1, 44;
life, on stream or current of, 64-5, 74-9, 80;
maternal love, on, 84;
memory, on, 43-52, 98-101;
metaphysics of, in relation to facts, 2, 203;
methods of reasoning, 100-1;
motion, theory of, 34, 83, 85;
nothing, his analysis of, 33-4, 110;
Pecten's eye, deductions from structure of, 22-6, 72-7;
pain, on, 41-2, 94, 96-7;
perception, on, 35-43, 49, 95, 96, 97;
parallelism, his refutation of, 35, 57-8, 93;
questionable statements made by, 59, 66;
sensory aphasia, on, 48-9;
'snowball' analogy, his, 18, 63;
Spencer's philosophy, on, 34;
success, his criterion of superiority, 84-5;
sympathy, a certain use of the term, 31, 89;
time, his theory of, 7, 17-21, 62-3, 64, 67-71, 157, 246;
torpor, instinct and intelligence, on, 27, 28-9;
vital impetus, his theory of, 7, 10-11, 24, 25-7, 31, 33, 67, 100, 158 (*see also* Life);
words, his misuse of, 54, 59, 64, 70-1, 80, 81, 85, 101, 102-3, 136, 195.
Berkeley, George, Bishop, philosophy of, 153-4.
Berkeleyan Idealism, 13, 153.

Biology, part played by natural selection in, 148;
science of, does not progress by instinct, 60.
Birds, 25, 80, 85.
Body and Mind, M'Dougall, commented on, 187-90.
Body, and mind, relation between, 35, 58, 145 (*see also* Parallelism); Bergson's theory of the function of, 38-40;
'directing memory towards the real,' 51-2.
Boileau, quoted, 160.
Bois-Reymond, Du, 148.
Boyle, Hon. Robert, cited on animal automatism, 144.
Brain, connection of, with consciousness and mind, 57-8, 100;
in relation to memory, 44-5, 47-52;
in relation to perception, 36-9, 41, 93, 95;
man's, 200-1;
representation of words in, 48, 99.
Brown-Séquard, 78 *note*.
Bruno, Giordano, doctrines and death of, 134;
persecuted for truth's sake, 238-40.
Büchner, his *Kraft und Stoff*, 147-8; lucidity of, 147-8, 198.
Bulletin de la Société Française de Philosophie, June 1901, Bergson's article in, 35.
Byron, quoted, 16, 227.

Cabanis, contributions of, to psychology, 148.
Cabbage, physiology of a, 177-8, 180.
Calvin, John, a predestinarian, 231, 232.
Causation, law of, 189.
Cellini, Benvenuto, 235.
Cerebral mechanism, 44.
Cerebral processes (or disturbances), consciousness an accompaniment of, 36-7, 41, 184-90, 231.
Chance, non-existent, 113, 114.
Characters, acquired or congenital, question of inheritance of, 24, 196.
Charles II., progress of science during his reign, 143.
Chemical affinity. *See* Energy, potential.
Chemistry, attitude of, towards time, 69.
Chinooks, superstitions of, 102.
Chlorophyll, stores light, 178.
Chlorophyllian function in plants, 28.
'Coat and nail' analogy, 57-8.
Coleridge, ambiguity of, criticised by Byron, 16.
Comte, Auguste, philosophy of, 149.
Consciousness (*see also* Mind):
an accompaniment, not a cause, 230-1;
Berkeley's deductions from, 153-4;
connection of, with brain, 58-9, 100 (*see* Cerebral processes);
evolution of a, 20, 65;
immateriality of, 183;
in relation to pain, 97-8;
in relation to mobility, 80;
in relation to time, 17-19, 21;
motive principle of evolution, the, 32;
not recognised by mechanism, 13;
physical basis of, 184-91;
presence of, in animals unproven, 138-9.
Continuity, law of, 139, 168, 188.
Copernicus, escaped persecution, 133-4;
doctrines of, advocated by Hobbes, 140;
relation of Bruno to, 238-9;
r. 127, 190.
Cremonini, scholasticism of, 133.
Critical Exposition of Bergson's Philosophy, J. M'Kellar Stewart, 61.
Cynics, the Greek, 121, 205.
Czolbe, 211.

DALTON, JOHN, his atomic theory, 163.
Dante, his *Inferno* quoted, 176; on *ignes fatui*, 226.
Darwin, cited on 'joyousness,' 217; his theory of Evolution, 10, 52, 73, 77 *note*, 189; Huxley's relation to, 239.
Demokritus, contemptuous of book-learning, 198; influence of, on Alexandrian science, 127; philosophy of, 113, 114-15; *r.* 54.
De partibus animalium, Aristotle, 126.
De rerum Natura, Lucretius, 128.
Descartes, René, affirmed animal automatism, 138; mechanistic tendencies of his philosophy, 132, 135-7, 150, 194, 238.
Determinism, bearing of, on moral responsibility, 208-9; distinction between, and fatalism, 232-5; influence of, on true philosophy of life, 228.
Dictionnaire Historique et Critique, Bayle, 145.
Diderot, *r.* 146, 150.
Differential Calculus, 153.
Diogenes of Apollonia, 108.
—— the Cynic, 121.
Duration. *See* Time.

EDUCABILITY, 200, 203.
Edwards, Jonathan, a predestinarian, 231, 232.
Eleatic School. *See* Philosophy, Greek, early.
Emotions or sentiments, ethical, 207-8; influence of, on beliefs, 112, 120, 203-8, 211-15; reproductive, 204-5; self-preservation, 204.
Empedokles, philosophy of, 114.
Energy, Conservation of, 169-171, 191; Kinetic, 172-3, 174; Potential, 172-4, 178; chemical affinity, 172-4; redistribution of, 171-2, 176, 178, 229; relation of, to motion, 170-1, 173-4, 175, 179-82.
England, philosophy in, 55, 133, 140, 242.
Epikureanism, 128.
Epikurus, lucidity of, 198; misunderstood, 120, 124-5; *r.* 134, 139, 144.
Epiphenomenalism, defined, 184; discussed, 187-90.
Epistemological inquiry, 111, 220.
Erasistratus, 127.
Ethics, a branch of science yet undefined, 220, 221; confusion between, and science, 119-22; influence of correct philosophy of life on, 223-4; relation of, to truth, 209-13.
Ethics, Spinoza, 152.
Eucken, R., cited, 123.
Euclid, 127.
Evolution, consciousness the motive principle of, 32; early unpopularity of materialist doctrine of, in England, 242; fundamental direction of, 81-2; main roads of, 80-2; similar structure occurring on divergent lines of, 22, 71-7. *See also* Life *and* Vital Impetus.
Evolution, Créatrice L', sketch of, 17-35; criticism of, 59-90.
Experience, subjective and objective, 36; *versus* intuition, 3.
Eye, a bird's, 25; of Pearly Nautilus, 76, 77; of Pecten, 23-5, 72-7; of vertebrates, 23, 72, 75, 76.

INDEX

FALLACIES:
Bergson's. *See* Bergson.
clearance of, by true philosophy, 202;
moral, 212;
origin of, 195, 199, 217-18;
survival of, 200.
Fatalism, distinction between, and determinism, 231-5.
Feeling (a quality of mind), psychological importance of, underestimated, 243-4.
Feuerbach, 147.
Fichte, postulates a vital impetus, 158;
r. 93.
Force, possible resolution of matter into, 92 *note*, 149, 156.

GALEN, assumed the existence of animal spirits, 134;
laid the foundations of medicine, 128.
Galileo, Physics of, 35, 90, 132, 133.
Gall, his system of phrenology, 100.
Gassendi, philosophy of, 139-40, 144;
strong historical sense of, 198.
German metaphysics. *See* Metaphysics.
Germany, philosophic materialism in, 147.
Goethe, quoted on vanities, 226-7;
r. 198.
Grote, George, quoted on Plato, 121-2.

HABIT-MEMORY. *See* Memory.
Habits of thinking, the *idée fixe*, 224-5.
Hallucination, 95.
Hartley, David, 198, 231.
Hartmann, E. von, 227.
Harvey, William, his discovery of the circulation of the blood, 135.
Hegel, absolute idealism of, 105;
analogy between, and Bergson, 159-60;
Hegel—*continued*:
metaphysical philosophy of, 6, 93, 114, 158, 160.
Heraklitus, philosophy of, 111, 113, 115.
Herophilus, 127.
Hibbert Journal, Mr. Balfour's article in, 207;
Bergson's 'Huxley,' lecture in, 213, 215.
Hipparchus, 127.
Hobbes, Thomas, cited on the expediency of religion, 210;
lucidity of, 198;
philosophy and writings of, 139, 140;
r. 55.
Holbach, D', a materialist, 195;
his *Système de la Nature*, 146.
Homme Machine, L', De Lamettrie, 145.
Hume, David, complete scepticism of, 154-5, 158.
Humility of the Life-stream, 26, 78, 79.
Huxley, attitude of, towards 'time,' compared with Bergson's, 21, 68-71;
Bergson's attitude towards, 69-71, 90;
defines epiphenomenalism, 184;
demands positive evidence, 98;
mechanistic views of, 168;
not a fatalist, 232;
resemblance of Bruno to, 239;
says the mechanical view is not irreligious, 231;
r. 138, 148.
Huyghens, doctrines of, 144.
Hylozoism, Greek, 104-5.
Hymenoptera, 27, 80;
pre-eminence of, 84-5.

IDEALISM, attractiveness of, 12;
Berkeleyan, 13, 153.
Ideas, Divine, 2;
innate, 141, 142.
Ignes fatui. *See* Will-o'-the-wisps.

Image-memory. *See* Memory.
Images, auditory, 47-8;
theories of, 38, 39, 42, 46, 49, 50, 91-2, 93.
Immobility, relativity of, 30.
Inconceivabilities, 156-7, 162, 165.
Indetermination, Bergson's use of the term, 39, 40;
inserted by life into matter, 28.
Individuation, tendency of the organism towards, 19.
Inductive method, origin of, in Alexandria, 127.
Infinity, 108-9.
Insect societies, alleged probable language of, 86.
Instinct, a characteristic of hymenoptera, 27, 80;
apparent manifestations of, in plants, 31, 82-3;
closeness of, to life, 8, 31, 214;
contrasted with intelligence, 8, 29-32, 33, 59-62, 86, 87, 200-3;
in relation to structure, 87.
See also Intuition.
Instruments, organised and unorganised, 29.
Intellect, in relation to feeling, 243-4;
in relation to mobility, 30-1, 85.
Intelligence, characteristic of man, 27, 80;
contrasted with instinct, 8, 29-32, 33, 59-62, 86, 87, 200-3.
Intolerance, rampant in the Middle Ages, 238;
still powerful, 240-1.
Introspection, failure of, 186-7.
Intuition, definitions of, 33, 214;
survival of, in metaphysics, 3, 200.
See also Instinct.
Ionian School. *See* Philosophy, Greek, early.
Isidore of Seville, his *Encyclopedia*, 131.

JAMES, WILLIAM, Pragmatism of, 8-9.
Jenner, Edward, public treatment of, 240-1.
Johnson, Dr. Samuel, 154.
Joy, a sign that 'our activity is in full expansion,' 215;
statement questioned, 216-17.
Judgment or choice, a problem of, 190-2.

KANT, IMMANUEL, his definition of 'self,' 6;
theories of, 17, 160-2.
Kayyám, Omar, 198.
Kepler, 61, 132.
Kraft und Stoff, Büchner, 147-8.

LABRE, BENEDICT JOSEPH, 205.
Lamarckism, 77-8 *note*.
Lamettrie, De, cheerfulness of his philosophy, 228;
his *L'Homme Machine*, and general tenor of his writings, 145-6.
Lange, F. A., cited, 104 *note*, 123, 132, 149, 198, 212.
Lankester, Sir Ray, cited on 'educability,' 200.
Laws, ethical and scientific, 211.
See also under individual headings as Causation.
Leibnitz, G. W., beliefs of, influenced by feeling, 206;
philosophy of, 152-3;
predestinarianism of, 231;
r., 74, 93.
Lesions, nerve, effects of, 40-1.
Lewes, G. H., cited on Aristotle, 122-3.
Life, stream or current of (*also called* Vital Impetus):
humility of, 26, 78-9;
'independence' of, 66-7;
is mobility, 83;
psychological character of, 74-5;
supplies 'indetermination' in matter, 28;
r., 19-20, 25-6, 32, 64, 65, 76, 77, 82.
See also Evolution.

Light, focusing of, 75;
storage of, in presence of chlorophyl, 178.
Locke, John, his contributions to psychology, 141-2;
and attack on Scholasticism, 143; *r.*, 55, 147.
Logic, province of, 220-1;
rules of, 195.
Lombroso school of criminology, 209.
Lucretius, Bruno influenced by, 134;
his *De rerum Natura*, 128.

M'Dougall, Dr. W., theories of, criticised, 187-90.
Machines, organic and inorganic, 174-82.
Man, goal of Evolution, the, 27, 32, 82, 84-5;
machine, the, 179-82;
psychical manifestations in, 183.
Mannikin fallacy, 55. *See* Bergson.
Materialism, scientific, assailed and defended, 163-5;
awakening of, in philosophy, 135;
Berkeley's refutation of, 153-5;
came to the fore with the Revival of Learning, 132;
element of metaphysical fancy in pure, 13;
English, 133;
Epikurus adheres to, 125;
expediency of, as a general belief questioned, 211;
nineteenth-century, 147-8;
only sound working hypothesis, 157, 162-3, 165;
progress of science based upon, 167-8;
reputed to have been espoused by the Assassins, 131-2;
spiritualism contrasted with, 139, 141, 192-4;
wane and wax of, 123, 149-50.
Materialists, German, doctrines of, 241-2.
Maternal love, Bergson's analogy on, 84.
Matière et Mémoire, a brief account of, 35-53;
criticism of, 91-101;
paralogism in, 57-8.
Matter:
action of Life upon, 26, 32;
indestructibility of, 169-71;
indetermination inserted in, by Life, 28;
memory, relation of, to, 52;
mind, relation of, to, 53;
obstacle to the vital impetus, an, 78;
organised by Life, 64;
possible resolution of, into force, 92 *note*, 149, 156;
reality of, 150-1, 155-6;
redistribution of, 171-2, 178, 229;
theoretically perceptible without sense-organs, 96.
Mechanism, scientific (*see also* Materialism):
attitude of, towards time, 17;
Bergson's attempted refutations of, 20-2, 67-77;
denies 'spirit,' 192-4;
progress of, in Alexandria, 127;
supremacy of, ought to tend to happiness, 228-9.
Mechanistic view of the Universe, 9-12.
Medicine, science of, attitude of, towards time, 69;
does not work by intuition, 60-1;
progress of, materialistic, 168.
Meditations of Marcus Aurelius, 211-12.
Memory, Bergson's theory of, 43-52, 98, 101;
-habit, 45-6, 47;
-image, 46.
Metaphysics, cannot explain consciousness, 230;
contrasted with positive science, 1-4, 6, 8, 12, 80-1, 89, 92-3, 95, 104-7, 139, 150-1;

Metaphysics—*continued:*
errors in Bergson's, 203;
errors in Plato's, 205;
German, 55, 105;
inutility of, 160-2, 166, 218, 221, 223;
obscurity of, 4-6, 7, 16, 129, 162;
theories of Hume and Hegel, absolutely barren, 158-9;
underestimates feeling, 243.
Metchnikoff, 'disharmonies' of, 166.
Middle Ages, intellectual decadence of, 129, 141, 150;
Oxford University in, 239.
Mill, James, doctrines of, 223.
—— John Stuart, cited, 156, 181-2.
Mind (*see also* Consciousness):
assumed 'sparking' action of, 190-2;
body in relation to, 35, 58, 145;
divisions of mental activity, 243-4;
reality of, assumed, 150-1, 155.
Mobility, failure of intellect to grasp, 30-1;
is Life, 83.
Moleschott, *r.*, 147.
Molluscs, eyes of, 72, 75-7.
Montesquieu, quoted on laws, 211.
Morality, various views of, 120-1.
Moral responsibility, bearing of determinism on, 208-9.
Motion, Bergson's theory of, 34, 83, 85;
relation of, to energy, 170-1, 173-5, 179-82.

NATURAL SELECTION, influence of, on beliefs, 199-200;
operates in condemnation of anti-social acts, 208-9.
Nature, 'joy-signal' in, 215-17;
machines made by, 176. *See* Machines.
'Nail and coat' analogy, 57-8.
Neo-Darwinism, Bergson's attitude towards, 86.
Neo-Lamarckism, 24, 25, 73.
Nerve lesions, influence of, on perception, 40-1.
Nervous system, the, 28.
Newton, Sir Isaac:
doctrines of, introduced by Voltaire to France, 146;
Leibnitz, in relation to, 152-3;
manner of his discovery of gravitation, 14;
theories of, opposed by Hegel, 159;
utility of his discoveries, 222;
r., 61, 115, 144, 170.
Nietzsche, 212.
Nominalism *versus* Realism, 130.
Nothing, Bergson's analysis of, 33-4, 110.
Nouns, proper, 48, 49.
Number, Pythagorean theory of, 109, 110.

OBJECTS, in relation to perception, 36-7, 95.
Obscurity of metaphysical arguments, 4-7, 16, 113, 160-2.
Obsessions, 244-5.
Occam, William of, 133.
Ontological inquiry, 111, 220.
Organism, tendency of the, towards individuation, 19.
Origen, 205.
Oxford University in the Middle Ages, 239.

PAILLERON, his *Le Monde où l'on s'ennuie*, 228.
Pain, Bergsonian and physiological theories of, contrasted, 41-2, 94, 96-7.
Paracelsus, 134.
Parallelism, psycho-physical (*see also* Body and Mind):
Bergson's attempted refutation of, 35, 58, 93;
defence of, 94.
Parmenides, philosophy of, 110, 111.

Past, the, existence of in 'real' time, 18-19;
'gnawing into the future,' 51;
survives under two forms, 44, 46.
Pearly Nautilus, eye of, 76-7.
Pecten, eye of, 23, 24, 72, 74, 75, 77.
Perception:
connection of, with brain, 36-9, 40-1, 93-5;
memory, relation of, to, 43, 49-50;
nerve lesions, effect of, on, 40-1;
pain in relation to, 41-2, 96;
theory of, in *Matière et Mémoire*, 35 *et sqq.*
Philology, 127.
Philosophy:
Arabic, 131;
Bergson's definition of, 34;
dissipates errors and superstitions, 107-8, 126, 135, 141, 202;
English, 55, 133, 140;
failure of, in search for final truth, 165;
Greek, early, 108-11;
—— later, 111-25;
influence of, on conduct, 223-4, 242-3;
misuse of words in Greek, 54 (*see also* Obscurity);
net result of, 125-6, 127;
of life, influence of determinism on, 228-35;
opposed tendencies in, 104 *et sqq.*;
should not countenance 'intuitions,' 214;
two elements of value in, 219.
Phrenology, 100.
Physico-chemical theory of life. *See* Mechanism.
Physics, relation of, to philosophy according to Spencer's view, 222.
Plants, evolution of, 27-8, 81-2, 86 (*see also* Cabbage);
instinct said to be manifested by, 31, 82-3;
sexual generation a luxury in, 28, 81;
torpor in, 27, 80.
Plato, beliefs of, influenced by emotion, 205;
deduction taught by, 127;
nature of value in his writings, 106, 238;
philosophy of, criticised, 121-3.
Platonists, 104, 105-6.
Pleasure, differentiated from joy, 215.
Plotinus, philosophy of, 128-9, 134.
Polybius, 127.
Pragmatism, 8.
Pragmatists, 116.
Priestley, Joseph, unpopularity of, 240.
Proclus, 128.
Protagoras, philosophy of, 116.
Protoplasm, genesis of, 178.
Psychology, association doctrine, 13-14, 50, 166;
contributions of Cabanis to, 148;
Locke's contributions to, 141-2;
independent of philosophy, 220;
feeling underestimated by, 243.
Ptolemaic astronomers, the, 205-6, 213.
Ptolemy, 127, 131.
Pyrrho, scepticism of, 123.
Pythagoras, philosophy of, 109-10.

RAVAISSON, quoted, 52.
Realism *versus* nominalism, 130.
Realists, mediæval, opinions of, 66.
Re-birth, theory of, 210.
Redistribution of matter and energy, 171-2, 178, 229.
Religion, expediency of, discussed, 209-10;
explained by tendency and education, 196-7;
overcomes science in Middle Ages, 129.
Representation, of images, 38-40, 44.
Robinet, 147.
Rousseau, J. J., 243.
Royal Society, foundation of, 143.

SCEPTICISM, absolute, barrenness of, 155, 157, 162.
Schelling, F. W. J., 158.
Schlegel, F., cited, 104, 105.
Scholasticism, 90, 129, 133, 134, 143.
Schopenhauer, pessimism of, 227-8.
Science, confusion of, with ethics, 119-21;
contrasted with metaphysics, 1-4, 6, 8, 12, 80-1, 89, 92-3, 95, 104-7, 139, 150-1;
demands proof of 'spirit,' 149, 192-4;
disharmonies between, and intuitions, 214, 218;
early progress of, in Alexandria, 127-8;
finds no cause in consciousness, 231;
has become divorced from philosophy, 219;
modern, attitude of towards 'soul,' 184;
overcome by religion in Middle Ages, 129;
progress of, based upon materialism, 148, 167.
Self, the, Kant's definition of, 6.
Sensory aphasia, 48-9, 98, 99.
Sentiment. *See* Emotion or feeling.
Shakespeare, quoted on determinism, 233.
Sokrates:
attacks the Sophists, 119;
moral bias of, 212;
persecuted for truth's sake, 237-8, 239;
philosophy of, 119-21, 123;
title of, to fame, 118;
r., 205.
Sophists, attacked by Sokrates, 118-19;
philosophy of, 116-17;
r., 238.
Soul, theories concerning the, 184.
Souvenirs Entomologiques, Fabre, 88.
Space, considered by science, 17;
inconceivability of, 156.
Spencer, Herbert:
attacks misuse of words, 55;
barrenness of his laws, 222;
Bergsonian criticism of, 34;
cited on 'redistribution,' 171;
lucidity of, 198;
materialistic basis of his philosophy, 149;
philosophy of, 138, 221-2;
theories of, somewhat similar to Kant's, 161-2.
Spinal cord, functions of, 38.
Spinoza, his philosophy and *Ethics*, 151-2;
r., 74, 93, 226.
'Spirit,' an independent variable, 228;
an unsound hypothesis, 157;
Bergsonian theory of, 65, 89, 92;
existence of, denied by mechanism, 149, 192-4.
Spirits, 'animal,' 134.
Spiritualism, hard-pressed, 139, 145, 149;
Harvey's discovery a blow to, 135;
in Middle Ages, 141.
Stewart, Dr. J. M'Kellar, his *Critical Exposition of Bergson's Philosophy*, 61.
Stoicism, 128.
Structure, nerve, in relation to instinct, 87;
of eyes. *See* Eyes.
Structures, similar complex, occurring on divergent lines of evolution, 22 *et sqq.*
Stylites, Simeon, 205.
Success, a sign of superiority, 84-5.
Superstitions, dissipated by philosophy, 107, 108, 126, 135, 141, 202.
Sympathy, Bergson's use of the term in relation to instinct, 31, 89.
Système de la Nature, D'Holbach, 146.